WY-50/WY-50+ Maintenance Manual

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FCC NOTICE

☐ **Note:** This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

The use of shielded I/O cables is required when connecting this equipment to any and all optional peripheral or host devices. Failure to do so may violate FCC rules.

■ **Caution: Changes or modifications not covered in this manual must be approved in writing by the manufacturer's Regulatory Engineering department. Changes or modifications made without written approval may void the user's authority to operate this equipment.**

CANADIAN DOC NOTICE

This digital apparatus does not exceed the Class A limits for radio noise emissions from digital apparatus set out in the Radio Interference Regulations of the Canadian Department of Communications.

Le présent appareil numérique n'émet pas de bruits radioélectriques dépassant les limites applicables aux appareils numériques de la classe A prescrites dans le Règlement sur le brouillage radioélectrique édicté par le Ministère des Communications du Canada.

PREFACE

This maintenance manual contains information on how to service and repair the WY-50 and WY-50+ terminals. Appendix D describes additional diagnostic firmware specific to the WY-50+ terminal, an enhanced version of the WY-50. We assume you are a qualified service technician with previous experience in terminal and computer repair. To take full advantage of this manual, we suggest you read the information in the order presented.

HOW TO USE THIS MANUAL

This manual is divided into six chapters and four appendixes. Chapter one provides important information for the technician who has never serviced this terminal before. If you are already familiar with the terminal, the technical information in Appendix A can serve as an ongoing introduction. Here is a summary of this manual:

Chapter 1, "Product Overview" describes the terminal, including internal functions, I/O, telecommunications, environmental needs, and operator controls.

Chapter 2, "Removal and Replacement Procedures," shows you how to take the terminal apart and put it back together again. It includes instructions on how to change power requirements on the terminal from domestic to international.

Chapter 3, "Troubleshooting," tells you what to look for and how to fix problems on the terminal. It includes a list of tools needed for troubleshooting, a quick reference guide, and a flowchart.

Chapter 4, "Adjustments and Alignments," describes power supply and monitor adjustments that control the quality of the display.

Chapter 5, "Illustrated Parts List," includes a list of display and keyboard assembly parts.

Chapter 6, "Theory of Operation," describes the terminal operation by function.

Appendix A, "Specifications," lists the terminal's specifications.

Appendix B, "Connector Pin Assignments," lists the signals on each pin of the MODEM and the AUX ports located on the rear panel of the terminal.

Appendix C, "Schematics," includes schematics for the microprocessor PCB, keyboard, and monitor/power supply PCB.

Appendix D, "Servicing the WY-50+," describes new diagnostic firmware included in the WY-50+, the enhanced version of the WY-50, and lists new part numbers.

REFERENCE MANUALS

These publications provide additional information about the terminal.

WY-50 Display Terminal Reference Manual, Wyse 88-011-01

WY-50 Display Terminal Quick Reference Guide, Wyse 88-021-01

WY-50+ User's Guide, Wyse 880153-01

WY-50+ Programmer's Guide, Wyse 880154-01

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1 GENERAL INFORMATION

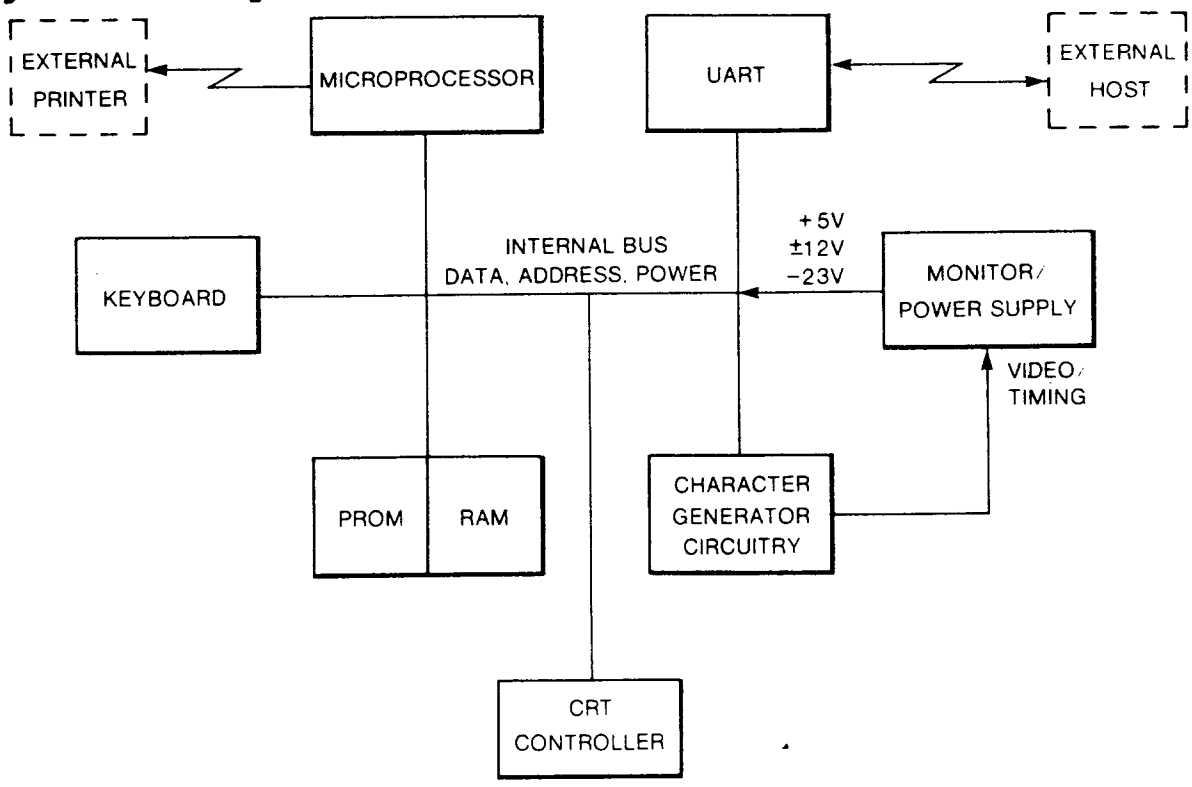
INTRODUCTION

The WY-50 is a compact, high-performance, low-cost terminal capable of meeting the needs of a wide variety of applications. The terminal consists of a display console and a detached keyboard from which data can be entered for display on the cathode ray tube (CRT). All of the electronics needed to support the display and keyboard are in the terminal.

In addition to the CRT and keyboard, the terminal contains two independent telecommunications interfaces. Peripherals, such as a hard-copy printer, attach to the terminal with the auxiliary interface connector on the rear panel.

All the component parts are organized around and controlled by the microprocessor. The microprocessor controls all internal data manipulation and processing functions. Figure 1-1 is a simplified block diagram of the terminal.

Figure 1-1 Simplified Block Diagram



HIGH LEVEL FUNCTIONAL DESCRIPTION

The terminal consists of a microprocessor, a CRT controller, associated control logic, and input/output (I/O) devices. This circuitry is mounted on a single printed circuit board (PCB) in the display console pedestal. The microprocessor controls all basic functions. Timing and control signals for the CRT are generated on the microprocessor PCB. The deflection, high-voltage, and power supply circuitry are located on a single PCB that sits just below the neck of the CRT. Cabling connects the microprocessor PCB and the monitor/power supply PCB. The microprocessor PCB is in the base of the terminal. The monitor/power supply PCB is inside the monitor.

MICROPROCESSOR

The heart of the terminal is an 8-bit, single component microprocessor that has 128 bytes of RAM, 32 I/O lines, two 16-bit counter/timers, a full-duplex UART, and integral interrupt and clock circuitry. The microprocessor uses an external EPROM for program storage. This EPROM can be either 4K, 8K, or 16K. In addition to EPROM, a buffer consisting of up to 4K of RAM holds display information. The microprocessor, CRT controller, and telecommunications interface electronics are attached to a bidirectional bus. These circuits can perform their functions independently while interfacing with the microprocessor or the memory on a direct-memory access (DMA) or interrupt basis.

MEMORY

The memory consists of RAM, EPROM, and EAROM. The RAM stores display information, which is repeatedly read from memory by the CRT controller. This information refreshes the CRT screen. The EPROM stores programs and contains the power-up and self-test routines. The EAROM stores the operator's setup parameters (i.e. baud rate and parity). The microprocessor has an address range capability of 64K. In addition to this addressing range capability, the microprocessor treats external program storage (EAROM) separately (it has its own enable line). This means that an external EPROM can use an additional 64K memory space without infringing on the space available for I/O or RAM. Figure 1-2 is a memory map for the terminal. Note that the EPROM is not shown in the figure because it does not occupy I/O or memory address space.

The standard RAM capacity is 4K and consists of two 2K x 8 RAMS. Each 2K x 8 RAM is allowed 8K of address space. The lower RAM

3FFFH. Since each RAM uses only 2K of address space, the RAM addressing wraps around at 2K page boundaries. The system firmware addresses the RAM from 1800H to 27FFH in order to access 4K of unique contiguous location.

Figure 1-2 Memory Map

HEX ADDRESS			
0000H	0FFFH	1st 2K OF RAM	RAM
1000H	1FFFH		
2000H	2FFFH	2nd 2K OF RAM	
3000H	3FFFH		
4000H	4FFFH	CRT CONTROLLER	CRT CONTROLLER
5000H	5FFFH		
6000H	6FFFH	S.I.O. (UART)	UART
7000H	7FFFH		
8000H	8FFFH	ROW BUFFER DIAGNOSTIC REGISTER	ROW BUFFER DIAGNOSTIC REGISTER
9000H	9FFFH		
A000H	AFFFH	KEYBOARD LATCH	KEYBOARD
B000H	BFFFH		
C000H	CFFFH	EAROM	EAROM
D000H	DFFFH		
E000H	EFFFH	UNASSIGNED	
F000H	FFFFH		

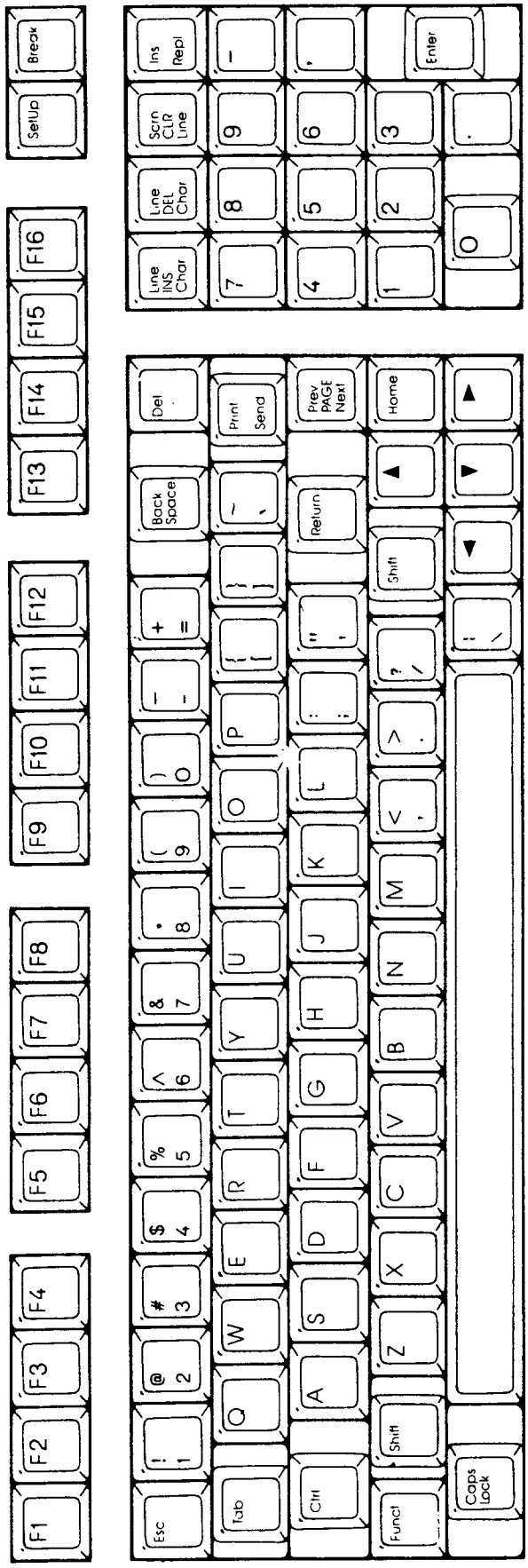
INPUT/OUTPUT DEVICES

The I/O devices consist of a keyboard, a CRT display, and two telecommunications interfaces.

Keyboard

The keyboard consists of 101 keys mounted on a single-sided printed circuit board. All keys have full-travel, hard-contact switches. The microprocessor periodically scans the keys checking for a key closure. Figure 1-3 illustrates the terminal's keyboard. A detailed description is found in "Theory of Operations," Chapter 6.

Figure 1-3 Keyboard



CRT Display

The terminal has a 14-inch CRT. It displays 24 rows of characters (either 80 or 132 columns) and two control rows (one for terminal status and the other for function key identification). The CRT controller reads displayed characters from RAM on a direct memory access basis.

TELECOMMUNICATIONS

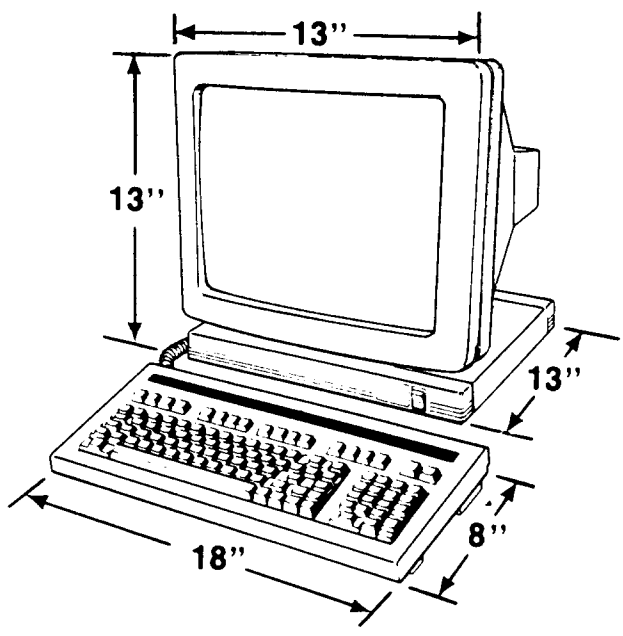
The terminal has two independent asynchronous interfaces that conform with the EIA standard RS-232C. Data rates can be set independently for either interface. The setup procedures in this chapter define the operator-controlled parameters. The operator-controlled parameters are defined in the setup procedures in this chapter. The primary (modem) interface can communicate at data rates up to 38.4K bps. The AUX (auxiliary printer) interface is unidirectional and can communicate at data rates up to 19.2K bps.

ENVIRONMENTAL CONSIDERATIONS

The terminal can be placed on a table, desktop, or any other vibration-free horizontal surface free from lint and dust. Abnormally bright room light or direct sunlight from a window can interfere with the display.

Figure 1-4 shows the terminal's dimensions. The user should allow three inches of clearance on all sides when installing the terminal, to allow air circulation and room for the tilt and swivel mechanism.

Figure 1-4 Terminal Dimensions



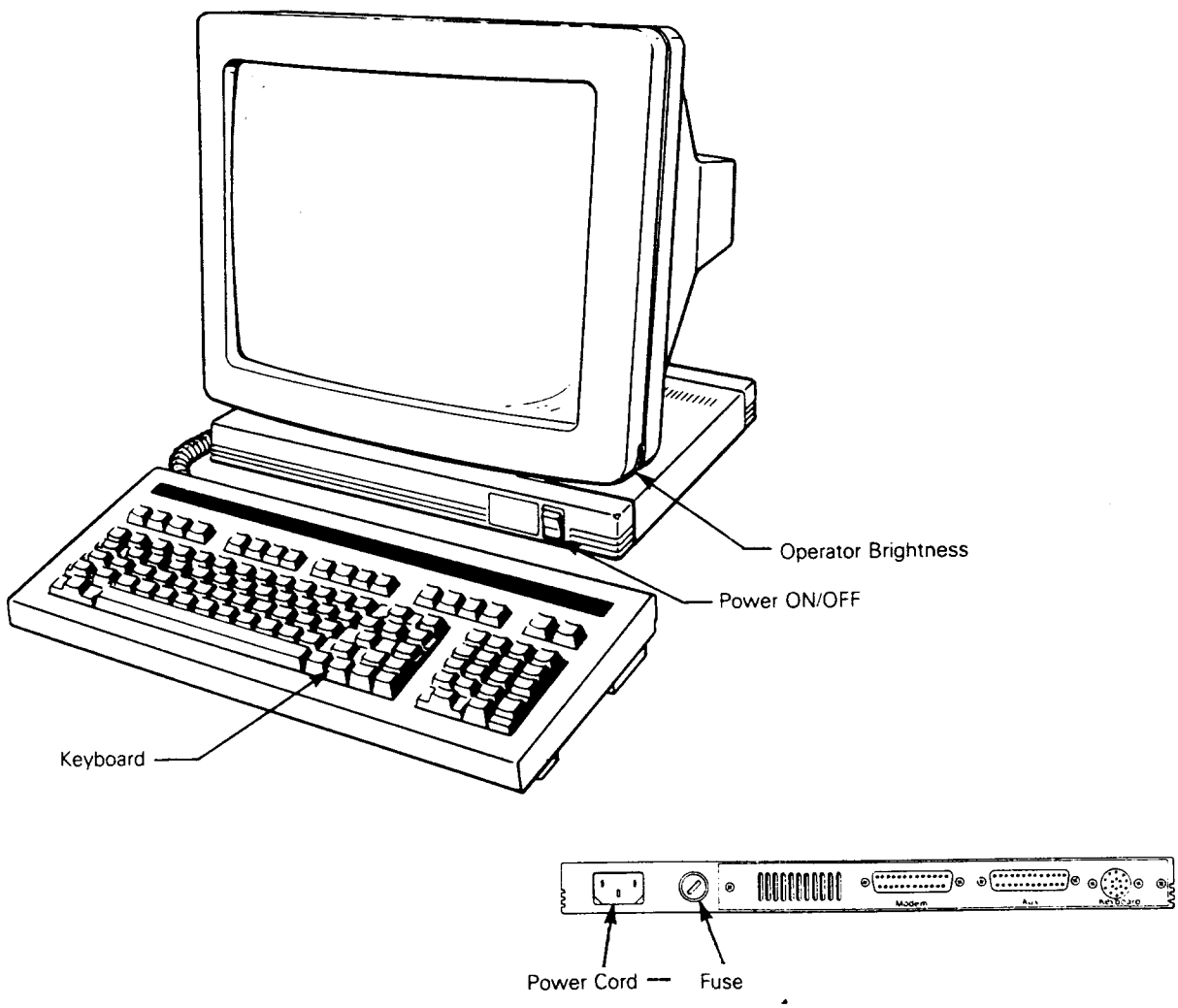
You can install the terminal next to most other types of electrical or electronic equipment without serious interference. Avoid locations near strong magnetic fields that can distort and interfere with the operation or servicing of the video display.

Ambient room temperature should never exceed 45 degrees Celsius (113 degrees Fahrenheit) when the terminal is on. No special cooling is necessary. Make sure the rear of the terminal has a free flow of air. Don't set it on sound-deadening devices that impede the intake of cooling air underneath it.

OPERATOR CONTROLS

Figure 1-5 shows all operator controls, including the keyboard, power, and external brightness. It also points out the MODEM and AUX communication connectors.

Figure 1-5 Operator Controls



Keyboard

Plug the keyboard into the keyboard connector on the rear panel. This plug fits only one way. Avoid unplugging or plugging in the keyboard when the power is on: you could damage the keyboard, the microprocessor board, or both.

CAUTION--Compare the voltage specified on the configuration label (on the back of the CRT enclosure) with the AC power source to prevent damaging the terminal.

Power Cord

You should insert the power cord into the connector on the rear panel. Then plug it into a grounded three-prong AC power source. The AC plug is keyed so it can't be inserted the wrong way.

Communications Cable

Connect the communications cable from the terminal or modem to the communications connector labeled MODEM. This port defaults to 9600 baud, no parity, with one stop bit and eight data bits. The operator can change these parameters by going into setup mode.

Connect the serial printer (if applicable) to the connector on the rear panel labeled AUX. This port is configured to operate at the same baud, parity, stop bit, and data bit as the MODEM port (the AUX port will operate up to 19.2K bps, the MODEM port will operate up to 38.4K bps). You can change these parameters by going into setup mode.

Fuse

The line fuse is located to the right of the power cord receptacle. Both domestic and international versions of the terminal require a standard fuse, 250 volts, 2 amperes. You can find instructions about changing it in "Removal and Replacement," Chapter 2.

Power Switch

The power switch is on the right of the console pedestal. Pressing the top of the switch turns AC power ON.

Brightness Control

The brightness control is a thumbwheel located on the lower right-hand corner of the CRT bezel. Rotating the wheel

clockwise increases the display brightness. Rotating it counterclockwise decreases the brightness.

SETUP PARAMETERS

When you turn the power on, the terminal beeps and executes an internal self-test. When the self-test finishes and the CRT is warm (approximately 30 seconds), the cursor appears in the upper left-hand corner of the display. The unit is now ready for operation based on the setup parameters.

To inspect the parameters, press SHIFT while simultaneously pressing SETUP. The first level of parameters appears across the bottom of the screen. To examine the other four levels of parameters, press ▼ key. Each time you press this key, you can see another level. Change parameters with this procedure:

1. Enter the setup mode by pressing SHIFT and SETUP simultaneously.

2. Press ▼ key until the parameter to be changed is displayed on the bottom row of the screen.

3. Press ► key until the specific parameter to be changed is highlighted.

4. Press the spacebar to advance the parameter to the specific setting desired.

5. Press the cursor keys to advance to the next parameter to be changed.

6. To leave the setup mode, press SHIFT and SETUP simultaneously.

   The status line flashes a message asking if the changed parameters should be saved for power-on. Parameter changes not saved are implemented immediately. The next time the terminal is turned on, any parameters established **before** the unsaved changes will be the parameters under which it operates.

   Pressing Y saves the parameters keyed in but does not alter any of the function key definitions.

   Pressing A saves all changes made (maximum, four bytes per function key).

7. To return to a normal operation mode, press any key.

   The terminal is now operational using the parameters defined in the setup mode.

   To get back to the power-on default parameters without

cycling the power, press ESC while in the setup mode.

See the WY-50 Reference Manual for more comprehensive setup instructions.

CLEANING

The terminal needs an occasional cleaning. The screen should be cleaned with a soft, lint-free cloth. Don't ever use chemical substances, abrasives, or commercial glass cleaners that contain alcohol or ammonia to clean the screen. (Apply the cleaner to the cloth, not directly to the screen.)

2 REMOVING AND REPLACING COMPONENTS

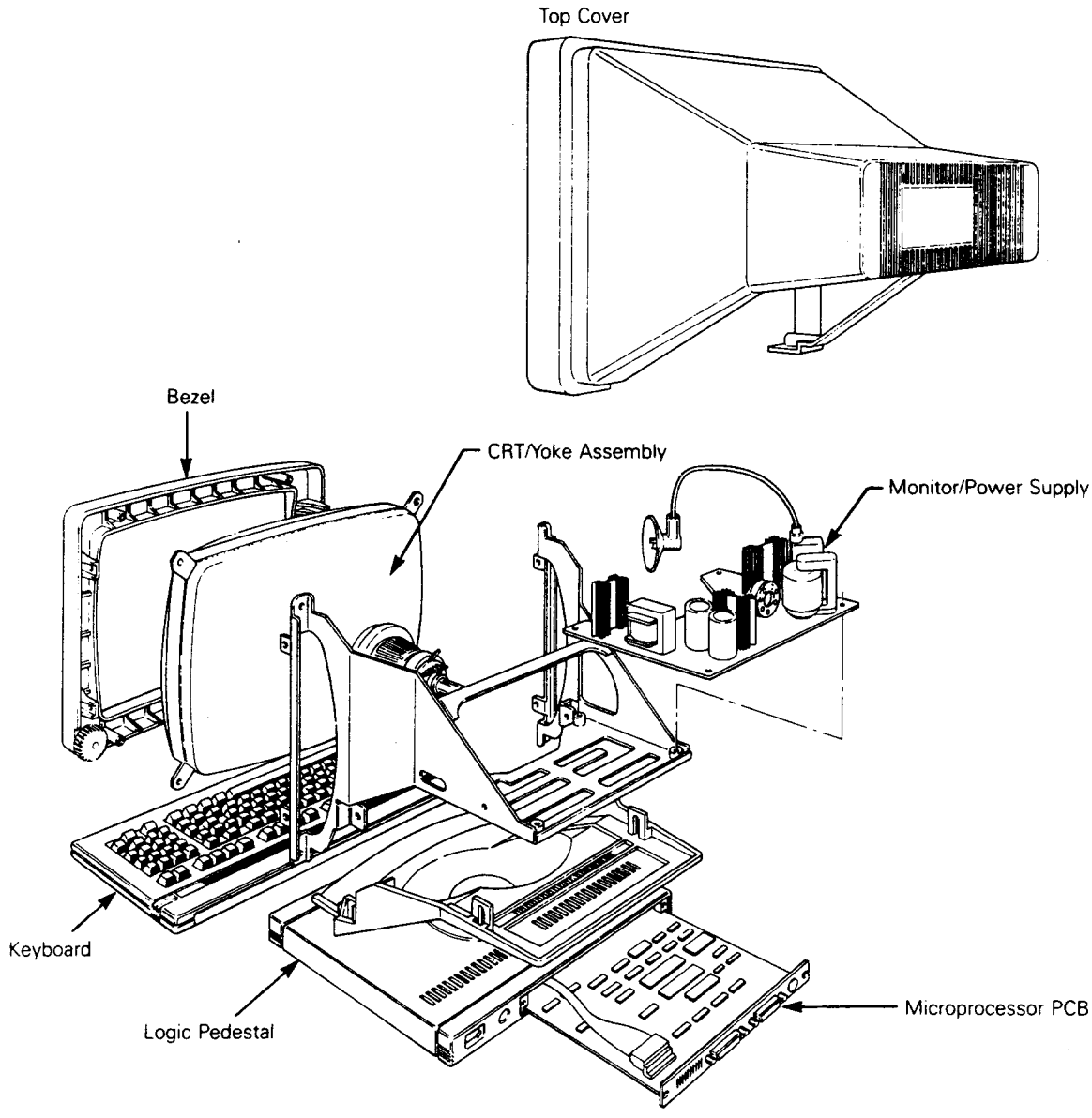
MODULES

This chapter describes how to remove and install each module. For purposes of orientation, FRONT is the monitor face, BACK is the rear panel and power cord location (see Figure 2-2).

The terminal consists of these four major modules (see Figure 2-1):

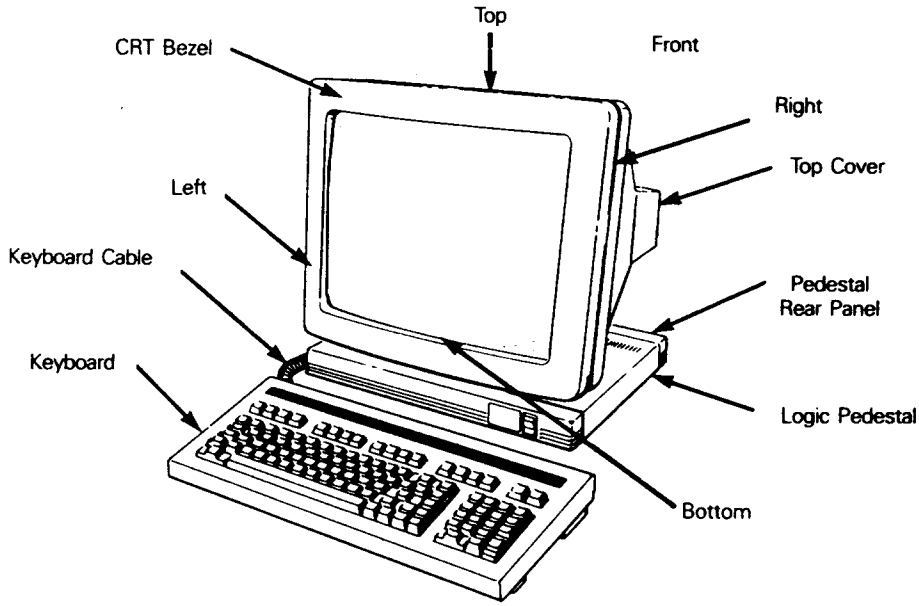
Module Name	
o Monitor/Power Supply	The monitor/power supply performs two major functions: it converts AC input voltage to the required DC voltages (+5V, +12V, -12V, -23V, and +24.5V) and it amplifies and displays horizontal, vertical, and video signals on the CRT screen.
o Keyboard	The keyboard is a scanned matrix. When the user presses a key, the keyboard flags the CPU to generate the appropriate key code. The CPU also debounces keys.
o Microprocessor PCB	The microprocessor PCB generates video and output signals. All control logic is on this PCB.
o CRT/Yoke Assembly	The CRT/yoke assembly contains both the cathode ray tube and the yoke that deflects the electron beam.

Figure 2-1 Four Major Modules



All modules within the terminal can be removed for repair or replacement by the service technician without any special tools.

Figure 2-2 Orientation View of Terminal and Components



WARNING--There are high voltages present. Only qualified service technicians should open up the terminal housing.

The following paragraphs describe removal and replacement procedures for these components and modules:

- Fuse
- Keyboard
- Keyboard cable
- Keyboard PCB
- Monitor/power supply PCB
- CRT/yoke assembly
- External brightness potentiometer (operator control)
- AC power switch
- Microprocessor PCB

If you have the materials and tools listed here, you will be prepared to remove and replace any of the parts or assemblies in this chapter.

Materials:

Standard fuse, 250 volts, 2 amperes
Tie wraps

Required Tools:

Insulated slotted screwdriver, 12"

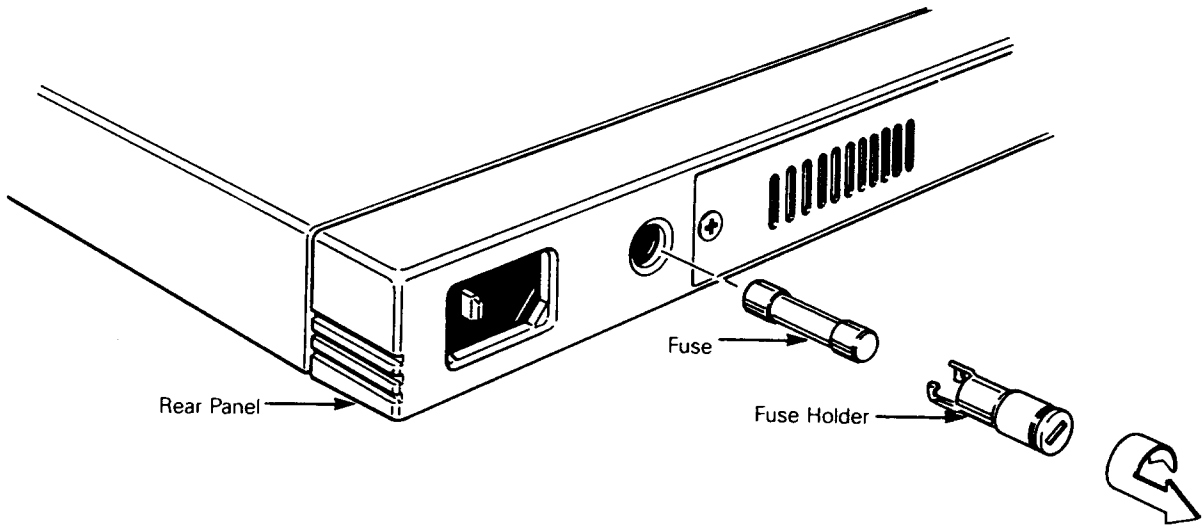
No. 1 Phillips screwdriver, 12"
No. 2 Phillips screwdriver

Recommended Tools:
Ohmmeter
Shorting stick

FUSE REPLACEMENT

Tools Required:
Slotted screwdriver
Standard fuse, 250 volts, 2 amperes
Ohmmeter (recommended)

Figure 2-3 Line Fuse Location



1. Disconnect the terminal from its power source.

2. Push the fuse holder in with a slotted screwdriver. Twist it counterclockwise until it releases.

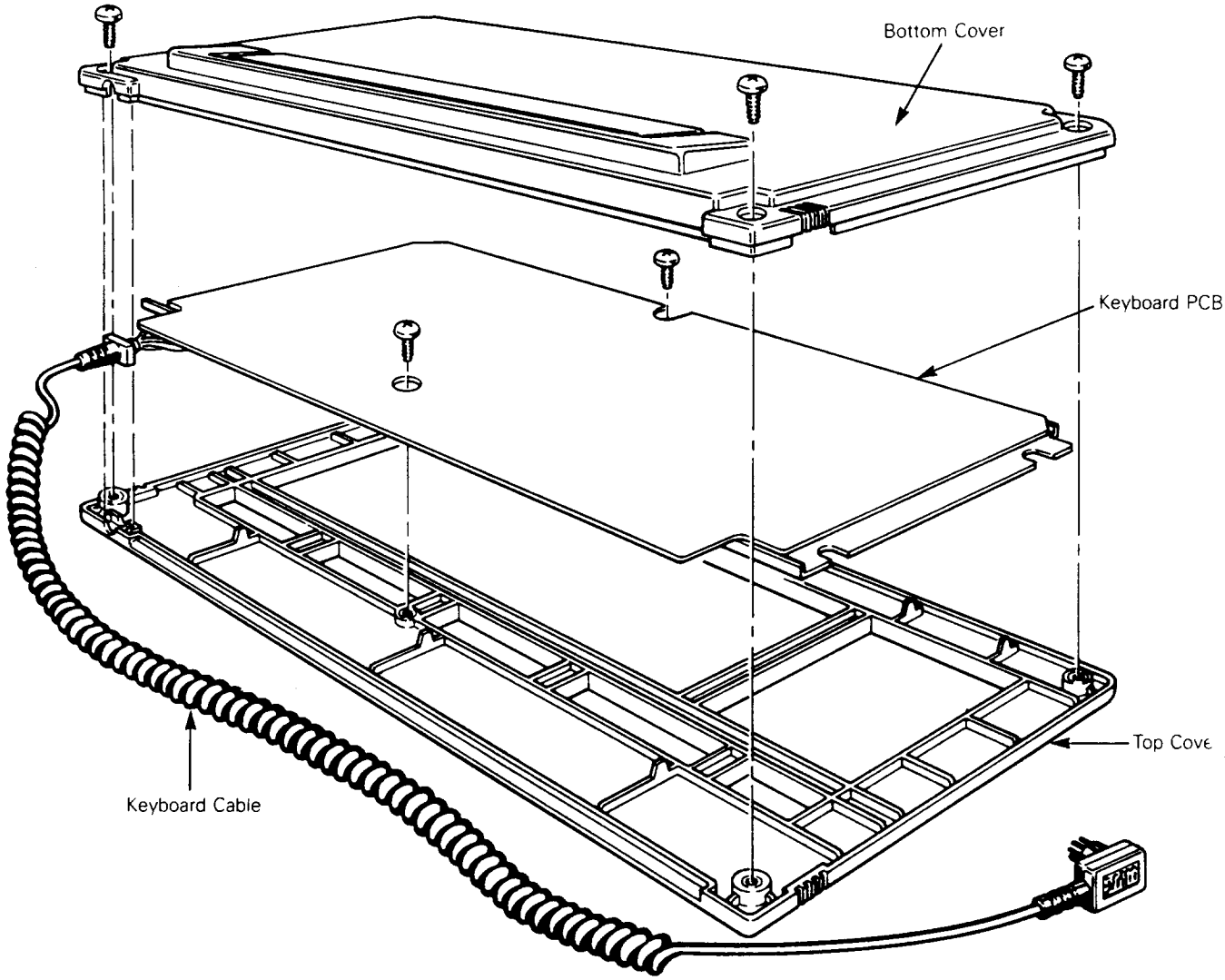
3. Inspect the fuse. If it is broken or blackened, replace it with a new fuse in the fuse holder. (Check continuity of the new fuse with an ohmmeter.)

4. Push the fuse holder and new fuse back into the fuse socket with a slotted screwdriver. Twist the fuse holder clockwise until it locks in place.

KEYBOARD REPLACEMENT

Tools Required:
None

Figure 2-4 Keyboard Assembly



1. Disconnect the terminal from its AC power source.

2. Unplug the keyboard cable from the keyboard connector at the rear panel.

3. Plug the new keyboard into the rear panel.

KEYBOARD CABLE REPLACEMENT

Tools Required:
No. 2 Phillips screwdriver

See Figure 2-4.

This is the procedure to replace the keyboard cable:

1. Disconnect the terminal from its AC power source.

2. Unplug the keyboard cable from the rear panel.

3. Turn the keyboard over and remove the four No. 2 Phillips head screws holding the keyboard bottom cover (one screw in each corner).

4. Lift the keyboard bottom cover off of the keyboard assembly.

5. Remove the two No. 2 Phillips head screws holding the keyboard top cover to the metal frame and PCB assembly. Lift the PCB assembly out of the keyboard.

6. Unscrew the No. 1 Phillips screw holding the keyboard cables shielded grounding strap to the keyboard.

7. Unplug the keyboard cable from the keyboard.

8. Connect the new keyboard cable to the connector on the PCB. Reconnect the grounding strap. (A few older keyboards do not have compatible connectors. You may have to replace both the cable and the PCB.)

9. Fit the keyboard PCB assembly back into the keyboard top cover. Make sure that the cable fits properly through the edge of the keyboard assembly, then replace the two No. 2 Phillips head screws that hold the PCB in place.

10. Reattach the rear cover of the keyboard assembly.

KEYBOARD PCB REPLACEMENT

Tools Required:
No. 2 Phillips screwdriver

See Figure 2-4.

This is the procedure to replace the keyboard PCB:

1. Disconnect the terminal from its AC power source.

2. Unplug the keyboard cable from the rear panel.

3. Turn the keyboard over and remove the four No. 2 Phillips head screws holding on the keyboard bottom cover (one screw in each corner) to the keyboard assembly.

4. Lift the keyboard bottom cover off of the keyboard assembly.

5. Remove the two No. 2 Phillips head screws holding the keyboard top cover to the metal frame and PCB assembly. Lift the PCB assembly out of the keyboard.

6. Unscrew the No. 1 Phillips screw holding the keyboard cables shielded grounding strap to the keyboard.

7. Unplug the keyboard cable from the keyboard.

8. Connect the keyboard cable to the keyboard connector on the new PCB. Reconnect the grounding strap.

9. Fit the keyboard PCB assembly back into the keyboard top cover. Make sure that the cable fits properly through the edge of the keyboard assembly, then replace the two No. 2 Phillips head screws that hold the PCB in place.

10. Reattach the bottom cover of the keyboard assembly.

TOP COVER REPLACEMENT

Tools Required:
No. 1 Phillips screwdriver, 12"

This is the procedure to remove and replace the top cover:

1. Turn the terminal off. Disconnect it from its AC power source.

2. Remove four No. 1 screws holding the top cover in place (one behind each of the four corners of the bezel).

3. Lift the cover up and away from the terminal.

4. Replacement is the reverse order of removal.

REPLACING THE MONITOR/POWER SUPPLY PCB

Tools Required:
No. 1 Phillips screwdriver, 12"
Insulated slotted screwdriver, 12"

See Figure 2-5.

CAUTION--High voltage is present. Only qualified service personnel should service the terminal.

Changing Power Requirements on the Terminal

The terminal operates at either 115 VAC, 60 Hz, or 230 VAC, 50 Hz. The operating voltage is controlled by a jumper located on

the monitor/power supply logic card. Look at Figure 2-5 for the jumper location.

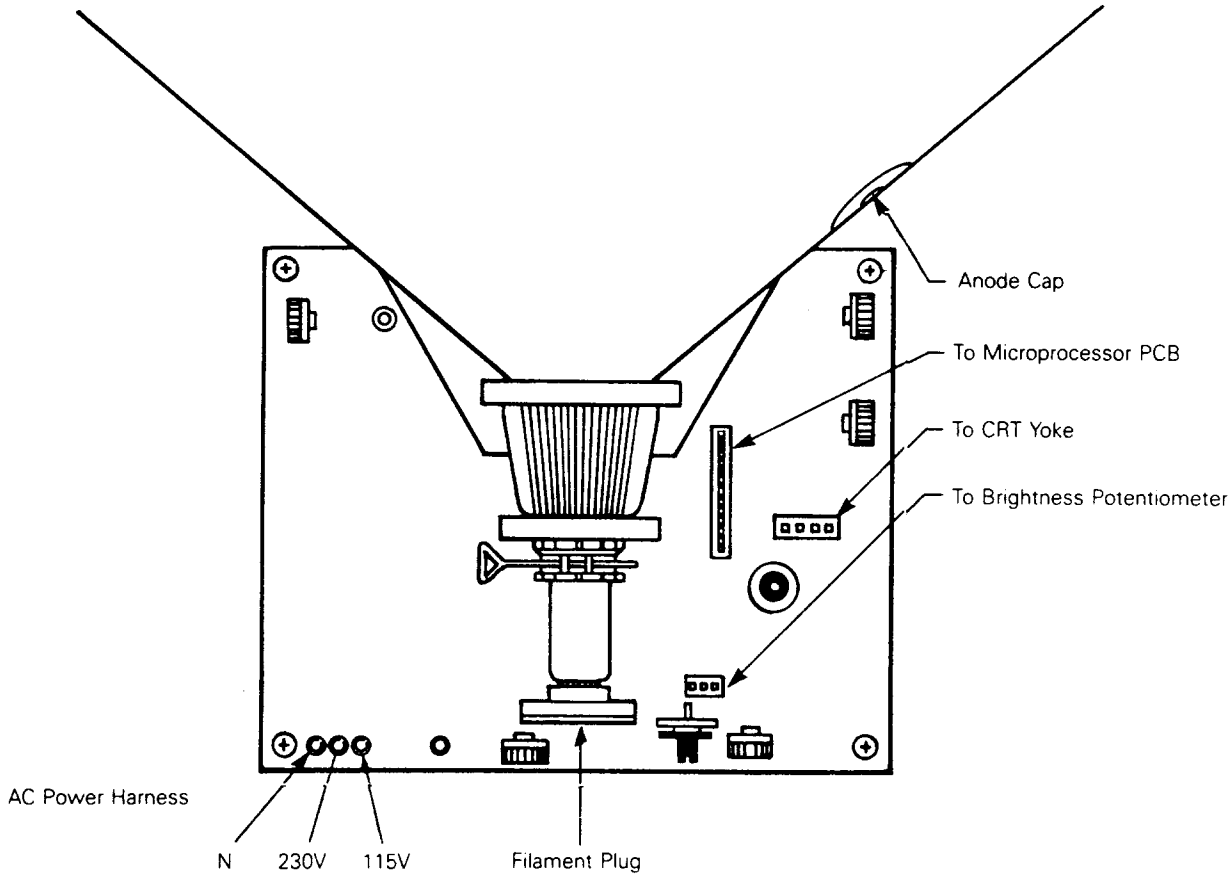
Before you change the monitor/power supply PCB, make sure the power on the new PCB is strapped correctly.

Here is the procedure to strap the power for 115 VAC (domestic):

1. Connect the crimp-on connector with the black wire to the pin marked 115 on the monitor/power supply PCB (see Figure 2-5).

2. Connect the crimp-on connector with no wire, to the pin marked 230 on the monitor/power supply PCB.

Figure 2-5 Monitor/Power Supply and Chassis



APPENDIX D SERVICING THE WY-50+

INTRODUCTION TO WY-50+ MAINTENANCE

Servicing the WY-50+ is nearly the same as servicing the WY-50. Major feature differences include the amber screen, additional compatible modes, a bi-directional AUX port, Wyseword standard, and multiple pages of memory (two standard, four optional). New servicing features include an expanded set of field diagnostics, a keyboard function test, a test to check all character sets, and two new built-in test patterns for display alignment.

TROUBLESHOOTING

Added troubleshooting features include an improved self-test, a new diagnostic self-test, a communication port test, a keyboard function test, an attribute/character font test, and a new display to check all attributes.

Note--Running the diagnostic tests described here (other than the power-on self-test) defaults all setup parameters and function keys.

Power-On Self-Test

When a user turns the terminal on, it performs a self-test of the logic PCB. If the self-test discovers a failure, an alphanumeric error code indicating failure type will appear in the lower-right corner of the display. An error code usually indicates logic PCB replacement. Table D-1 lists and explains the error codes.

Table D-1 Power-On Self-Test Error Codes

Error Message	Error Type
0	RAM bank 0
1	RAM bank 1
K	Reinitialize EAROM (Press the SETUP key to continue or turn off the terminal, then on again. Replace logic PCB only if error appears repeatedly.)
P	Code ROM checksum
Z	Processor RAM

The self-test checks RAM, EAROM, and the CPU. The RAM test is a read/write test that checks all 8K of RAM, or all 16K if additional memory is installed on the logic PCB. The CPU test checks 128 bytes of RAM in the CPU, the data lines, and the address lines. The EAROM test calculates the EAROM's checksum, and compares it to the checksum bit stored in the ROM.

FIELD DIAGNOSTICS

The WY-50+ contains four new field diagnostics:

- The System Diagnostic Test, an expanded version of the diagnostic self-test on page 3-2 of the WY-50 Maintenance Manual.
- A Transmit/Receive Test for the communications ports.
- A Keyboard Function Test.
- An Attribute/Character Font Test

The following sections describe the diagnostic procedures, the new error codes, and the new test connectors and cables.

System Diagnostic Test

This test is an expanded version of the power-on self-test. It checks memory, buffers, the CPU, and communications.

Follow these steps to perform the system diagnostic test:

1. Turn off the terminal.
2. Install the system diagnostic test connectors on the AUX and MODEM ports (see page D-4 for connector definitions).
3. Turn on the terminal.
4. Hold down the SHIFT key, then press the SETUP key.
5. Press the cursor DOWN key until the TEST parameter appears on the bottom line of the screen.
6. Press the cursor LEFT key once. The cursor highlights the TEST field.
7. Press the spacebar. This toggles the test field on.
8. Leave setup mode by holding down the SHIFT key and pressing the SETUP key again.
9. Save the selection by pressing the Y key. This starts the diagnostic self-test.

If the system diagnostic test doesn't find any errors, a flashing pattern should appear on the screen.

If it does find an error, the screen will blank and an error code will appear in the lower-right corner of the display. Replace the logic PCB.

Table D-2 lists and describes the system diagnostic test error codes.

Table D-2 System Diagnostic Test Error Codes

Error Message	Error Type
0	Buffer RAM, IC 0
1	Buffer RAM, IC 1 (if memory is expanded)
9	EAROM
R	Row Buffer
K	No initialization on power-up
A	Modem, RTS to CTS
C	Modem, DTR to DCD
E	AUX Ready to AUX RTS
P	Control PROM
Z	8031 processor
X	MODEM port loopback
Y	AUX port loopback

Caution--If you save the ON test parameter, turn off the power, and remove the test connectors, an error condition will result the next time someone turns on the terminal. Remember to default the terminal before returning it to the user.

Follow these steps to stop the system diagnostic test:

1. Hold down the space bar until the flashing pattern stops.
2. Turn the terminal off.
3. Remove the test connectors. Default the terminal.

System Diagnostic Test Connector Definitions--The diagnostic self-test connectors for both the MODEM and the AUX ports are made from 25-pin, male, D-type connectors. (You can find information to order ready-made connector sets under Parts List on page D-10.)

Connect these pins:

MODEM Port	**AUX Port**
Pin 2 to Pin 3 (TxD to RxD)	Pin 2 to Pin 3 (TxD to RxD)
Pin 4 to Pin 5 (RTS to CTS)	Pin 6 to Pin 20 (DSR to DTR)
Pin 8 to Pin 20 (DCD to DTR)	

Tramsmit/Receive Communication Port Test

This test transmits data between the MODEM and AUX ports. If either port doesn't receive or recognize the data from the other port, an error code will appear on the screen.

Follow these steps to perform the test:

1. Turn off the terminal.
2. Install the communication port test cable on the AUX and MODEM ports (see page D-5 for a cable definition).
3. Turn on the terminal.
4. Hold down the SHIFT key, then press the SETUP key.
5. Press the cursor DOWN key until the TEST parameter appears on the bottom line of the screen.
6. Press the cursor LEFT key once. The cursor highlights the TEST field.
7. Press the spacebar. This toggles the test field on.
8. Leave setup by holding down the SHIFT key and pressing the SETUP key again.
9. Save the selection by pressing the Y key. This starts the communications port test.

   If the communication port test doesn't find any errors, a flashing test pattern should appear on the screen.

   If the communication port test does find an error, the screen will blank and an error code will appear in the lower-right corner of the display. Replace the logic PCB. Table D-3 lists and describes the error codes.

Table D-3 Transmit/Receive Communication Port Test Error Codes

Error Message	Error Type
W	Xmit/Rcv error, MODEM to AUX
Z	Xmit/Rcv error, AUX to MODEM

Note--Error messages listed on other tables may appear when this test runs, but most errors will be those listed above.

Caution--If you save the ON test parameter, turn off the power, and remove the test connectors, an error condition will result the next time someone turns on the terminal. Remember to default the terminal before returning it to the user.

Follow these steps to stop the test:

1. Hold down the SETUP key until the flashing pattern stops.
2. Turn the terminal off.
3. Remove the test cable. Default the terminal.

Transmit/Receive Communication Port Test Cable Definitions--The transmit/receive communication port test cable requires two 25-pin, male, D-type connectors, and wire to connect pins on each connector and to connect the two connectors together. (You can find information to order ready-made cables under Parts List on page D-10.)

Connect these pins:

MODEM Port (DTE)		**AUX Port (DCE)**
Pin 2 (TxD)	to	Pin 2 (RxD)
Pin 3 (RxD)	to	Pin 3 (TxD)
Pins 4 to 5		Pins 6 to 20
Pins 8 to 20		

Keyboard Function Test

The keyboard function test checks the keyboard.

Note--The keyboard function test does not test the following keys: SHIFT, FUNCT, CAPS LOCK, SETUP, BREAK, or CTRL. If you press ENTER, the terminal will return to the system diagnostic test. Pressing function keys F1 through F16 will change attributes on portions of the test screen.

Follow these instructions to perform the keyboard test:

1. Start the system diagnostic test described on page D-2.

2. Hold down the space bar until the test pattern stops flashing.

3. Hold down the CTRL key, then press the A key until you see the screen in Figure D-1.

4. Find the bottom line of "m"s. Press the letter keys that you are testing, and watch the letters change in the middle of the bottom line.

   If the letter keys in question don't work, replace the keyboard PCB.

   If the letters do change during the test, but fail to respond during normal operation, check the logic PCB or the computer.

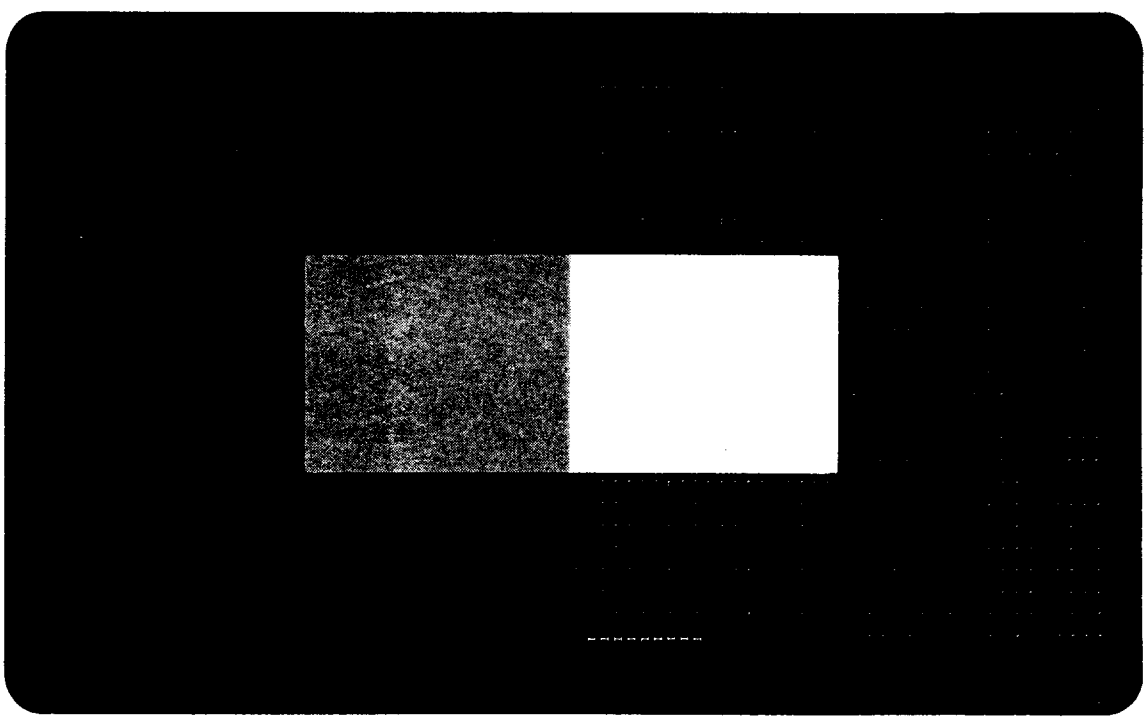
Follow these steps to stop the test:

1. Press the SETUP key until the flashing pattern stops.

2. Turn the terminal off.

3. Remove the test connectors. Default the terminal.

Figure D-1 Keyboard Function Test Pattern



Attribute/Character Font Test

This test allows you to check all the attributes and the character font.

Follow these steps to perform the test:

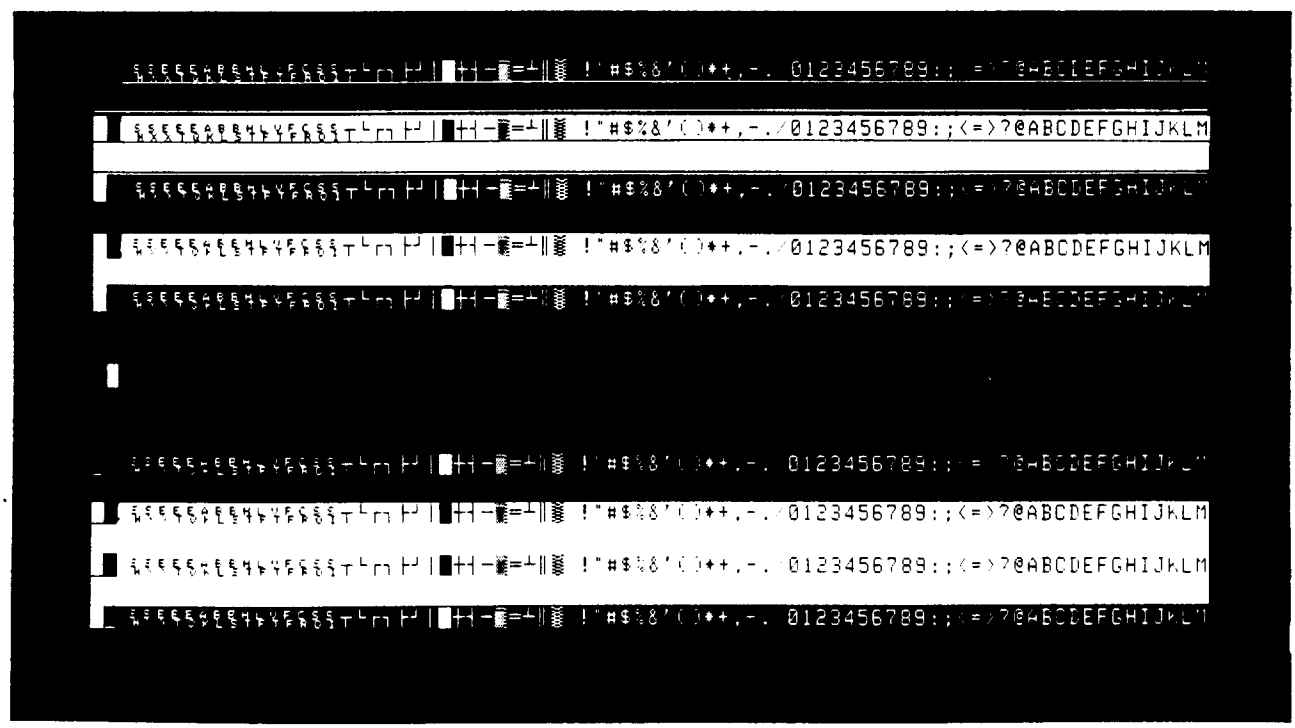
1. Start the system diagnostic test described on page D-2.
2. Hold the SETUP key down until the test pattern stops flashing.
3. Hold the CTRL key down, then press the A key until you see the screen in Figure D-2.
4. Look for the following features:

   Attributes: Normal, Blank, Blink, Underline, Dim, and Reverse

   A full character set

   If one or more of the features doesn't appear, replace the logic PCB.

Figure D-2 Attribute/Character Font Test Pattern



Follow these steps to stop the test:

1. Press the SETUP key until the flashing pattern stops.

2. Turn the terminal off.

3. Remove the test connectors. Default the terminal.

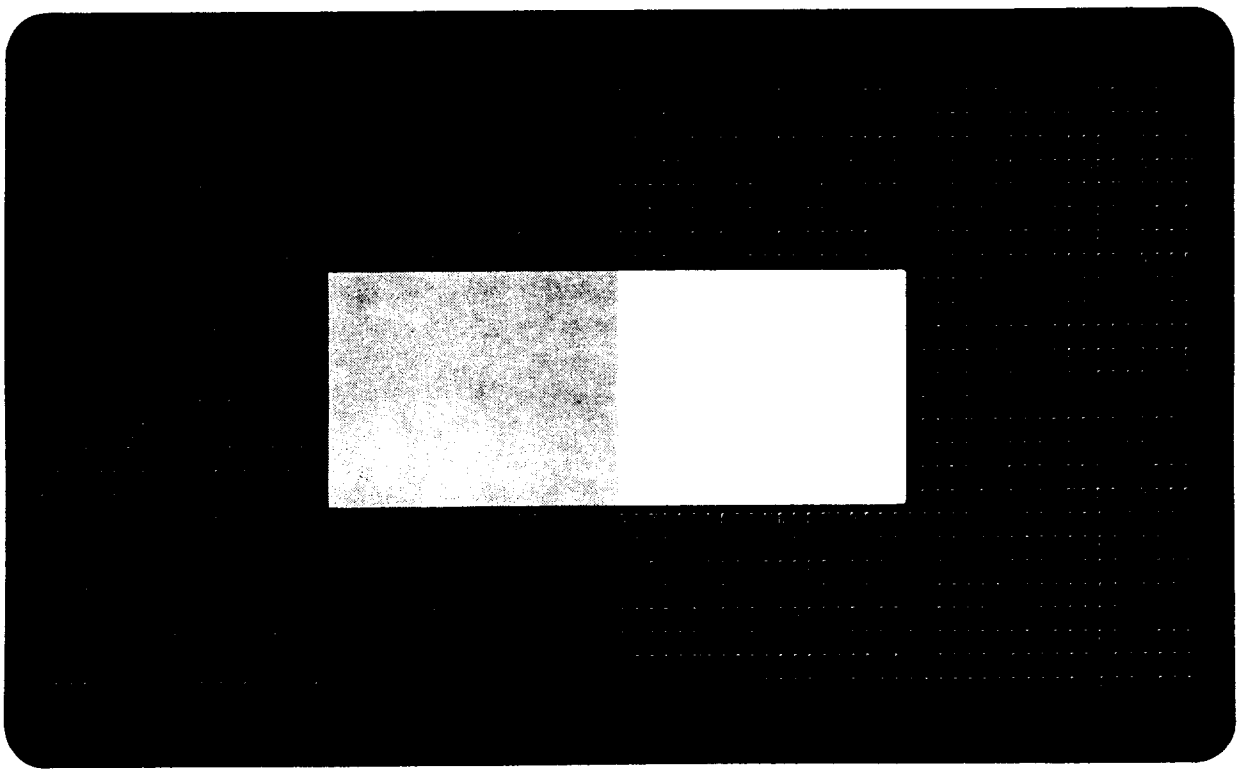
ALIGNMENT AND ADJUSTMENT

This terminal has two new test patterns, which you can call to align the display more accurately and quickly: Pattern M and Pattern O.

Pattern M

Pattern M helps you detect and correct linearity, brightness, and focus (see Figure D-3). This pattern is an 80-column display of characters. Two blocks in the center of the pattern indicate brightness: dim and normal.

Figure D-3 Pattern M



Pattern 0

Pattern 0 helps you detect and correct pincushion, tilt, centering, and size problems (see Figure D-4). This pattern is a full-reverse, normal brightness display in 80-column format. Two pairs of parallel lines cross in the center, making four quadrants. Two additional vertical lines, one on either side of the pattern, indicate brightness intensity levels.

Note--You can verify the display tolerances using a display reticle, available from WYSE, Part No. 09-001-03. Instructions to use the reticle are included with it.

Figure D-4 Pattern 0

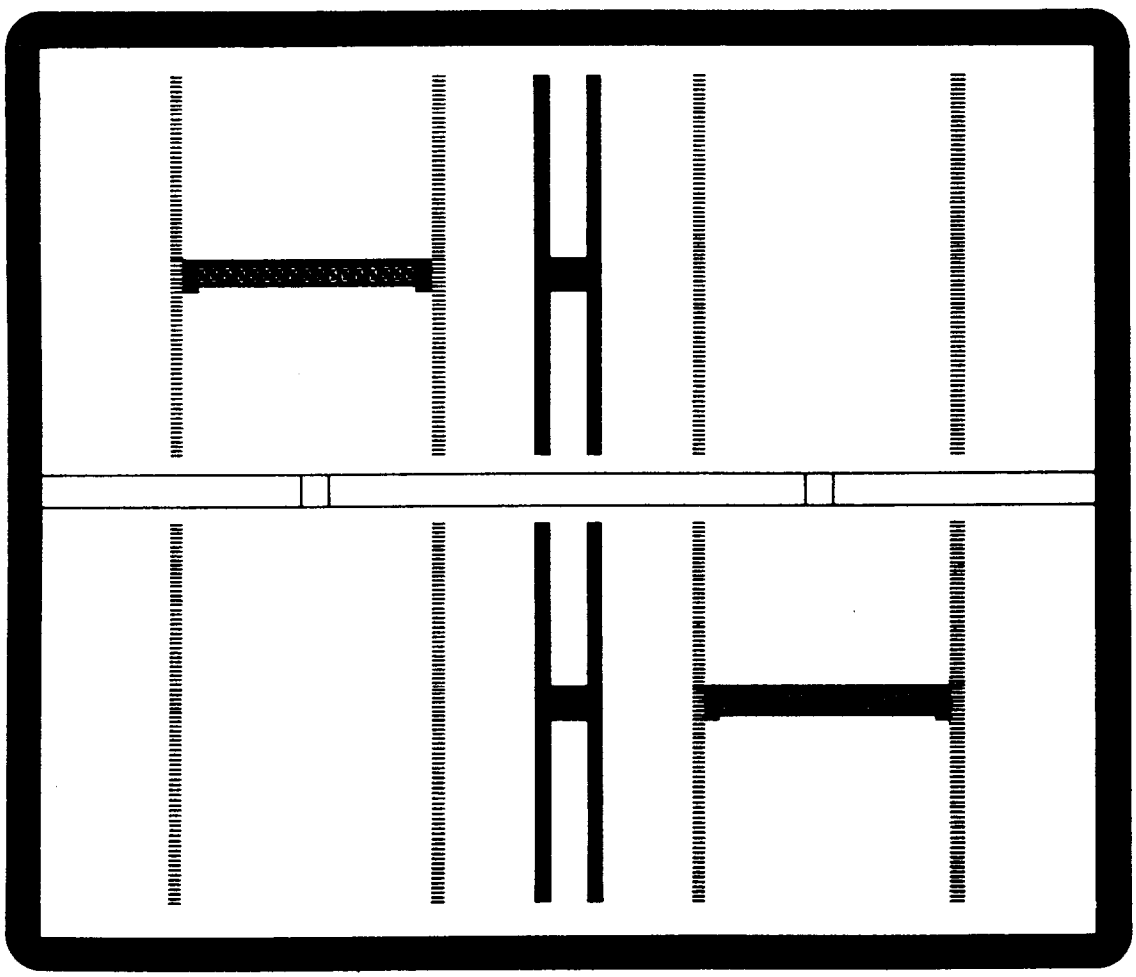


Table D-4 lists adjustments, display problems, and the pattern that is best suited to make the adjustment.

Table D-4 Test Pattern Problems and Adjustments

Test Pattern	Display Problems	Adjustments
M	Letters at the top of the display aren't the same height as those at the bottom of the display	Linearity
M	Fuzzy letters	Focus
M	Too bright; too dim; raster scan lines show	Brightness
O	Too short or too tall	Height
O	Too wide or too narrow	Width
O	Not centered	Centering
O	Not level	Yoke Lock
O	Pincushioning, barreling, crooked edges, corners sag or move out of tolerance	Display magnets

PARTS LIST

The WY-50+ contains three new assemblies that differ from the standard WY-50 terminal: the Logic PCB, the Monitor/Power Supply PCB, and the Amber CRT. The terminal also comes with test connectors and cables. You can order all other replaceable units with the spare part numbers assigned to the WY-50.

Part Number	Description
840293-01	WY-50+ Logic PCB
99-019-02	WY-50+ Monitor/Power PCB
780026-01	WY-50+ Amber CRT
94-0233-01	WY-50+ System Diagnostic Test Connector Set
94-0238-01	WY-50+ Transmit/Receive Comm Port Test Cable
09-001-03	WY-50+ Display Reticle

SCHEMATICS

See Appendix C, "Schematics," to find schematic diagrams of the WY-50+ Logic PCB and Monitor/Power Supply PCB.

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Here is the procedure to strap the power for 230 VAC (international):

1. Connect the crimp-on connector with the black wire to the pin marked 230 on the monitor/power supply PCB (see Figure 2-5).

2. Connect the crimp-on connector with no wire, to the pin marked 115 on the monitor/power supply PCB.

This is the procedure to remove and replace the monitor/power supply:

WARNING--High voltage is present. Do not touch the CRT or CRT anode unless you are a qualified service technician.

1. Disconnect the terminal from its AC power source.

2. Remove the four No. 1 Phillips screws holding the CRT cover in place (one screw in each corner).

3. Hold the CRT cover by both ends and pull it off.

4. Disconnect the microprocessor PCB wiring harness.

5. Ground the shaft of the slotted screwdriver on the metal chassis of the terminal. Slip the blade of the screwdriver under the anode cap. Discharge the CRT anode with an insulated slotted screwdriver.

6. Disconnect the brightness pot wiring harness (Figure 2-5).

7. Disconnect the AC power harness (Figure 2-5).

8. Disconnect the filament plug from the neck of the CRT.

9. Disconnect the yoke wiring harness plug.

10. Disconnect the anode cap from the CRT.

11. Remove the four Phillips screws that hold the monitor/power supply PCB to the CRT frame (one in each corner).

12. Slide the PC board out the rear of the CRT frame.

CAUTION--Before you reattach the anode cap to the CRT or the microprocessor PCB wiring harness to the monitor/power supply assembly, discharge the CRT anode again. Because of the capacitive coating inside the CRT, it can recharge itself. The terminal has a common ground. If there is a residual charge and the microprocessor PCB wiring harness is reconnected, it may damage components on that PCB.

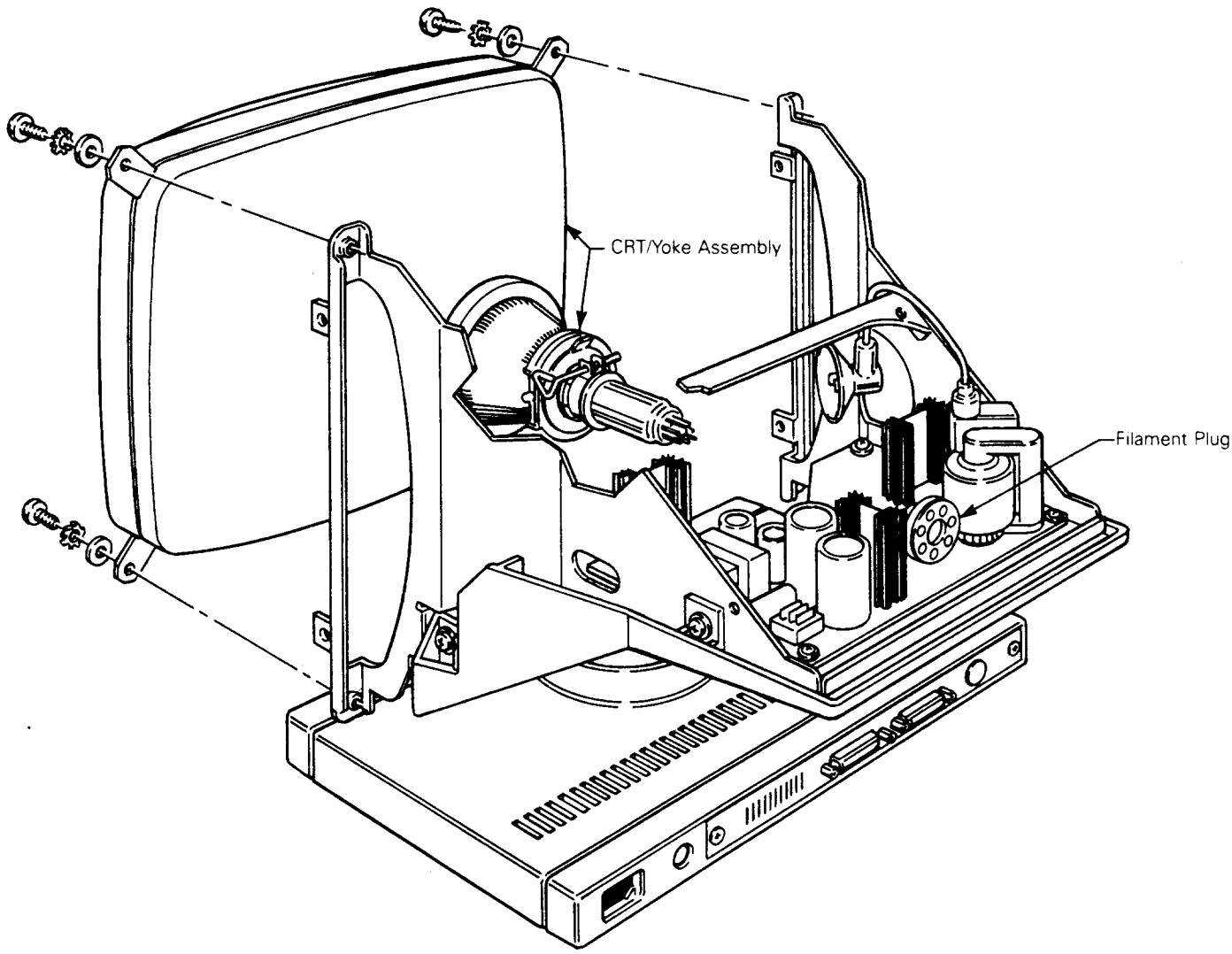
13. Install the monitor/power supply PCB in reverse order from removal.

14. When you replace the monitor/power supply PCB, realign the CRT. See "Theory of Operations," Chapter 6 for alignment information.

CRT/YOKE ASSEMBLY REPLACEMENT

Tools Required:
No. 1 Phillips screwdriver, 12"
Slotted screwdriver, 12"

Figure 2-6 CRT/Yoke Assembly



WARNING--High voltage is present. Only qualified service personnel should service this device.

This is the procedure for replacing the CRT/yoke assembly:

1. Disconnect the terminal from its AC power source.

2. Remove the four Phillips screws that hold the CRT cover in place (one screw in each corner).

3. Hold the CRT cover by both ends and pull it off.

4. Discharge the CRT anode with an insulated standard screwdriver.

5. Disconnect the anode cap from the CRT.

6. Disconnect the filament plug from the neck of the CRT.

7. Disconnect the yoke wiring harness plug.

8. Disconnect the microprocessor PCB wiring harness.

WARNING--High voltage is present. Do not touch the CRT or CRT anode unless you are a qualified service technician.

9. Remove the four Phillips screws that hold the bezel to the CRT. Remove the bezel.

WARNING--When you hold the CRT, make sure the screen faces the floor and the neck faces the ceiling. Don't bend over the CRT. If it implodes, the neck will shoot through the CRT screen. If the neck breaks off, it could fly in your face.

10. Remove the four Phillips screws, and assorted hardware at each corner of the CRT face that hold the front of the CRT/yoke assembly in the chassis.

11. Remove the CRT/yoke assembly from the chassis.

CAUTION--Before you reattach the anode cap to the CRT or the microprocessor PCB wiring harness to the monitor/power supply assembly, discharge the CRT anode again. Because of the capacitive coating inside the CRT, it may recharge itself. The terminal has a common ground. If there is a residual charge and the microprocessor PCB wiring harness is reconnected, it may damage components on that PCB.

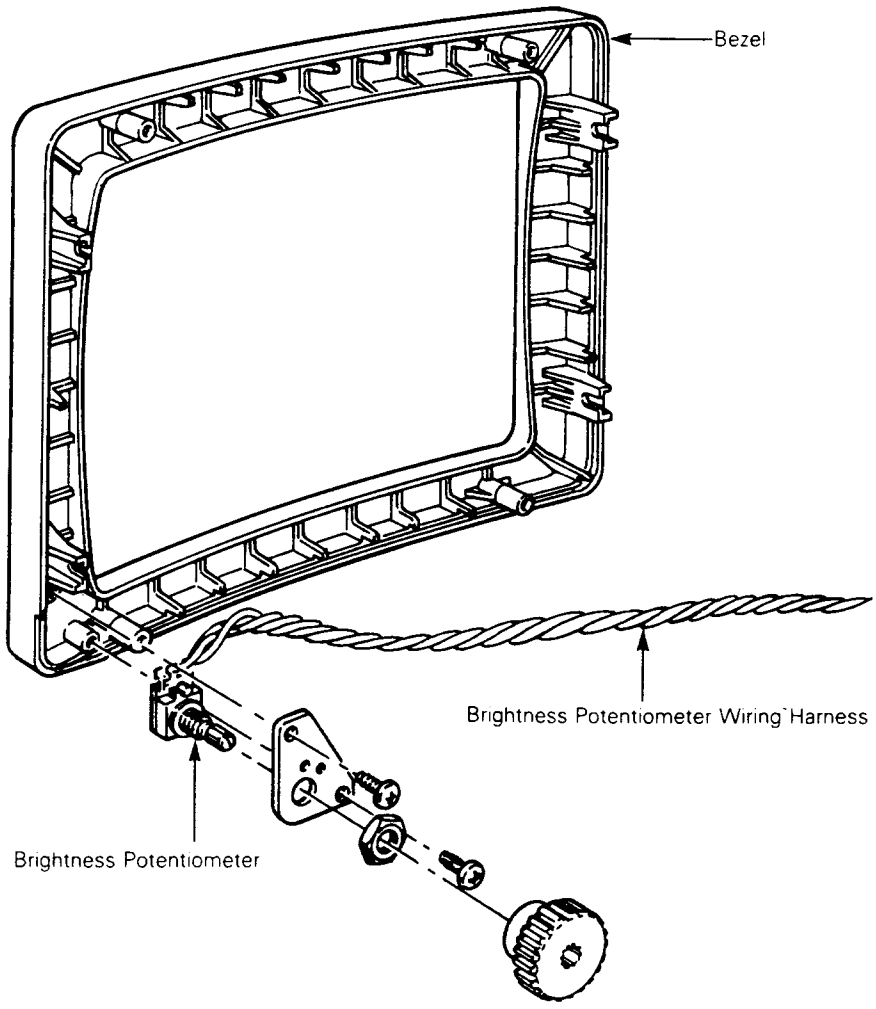
12. Install the CRT/yoke assembly in the reverse order from removal.

13. When you replace the monitor/power supply PCB, you must realign the CRT. See "Theory of Operations," Chapter 6 for alignment information.

BRIGHTNESS POTENTIOMETER REPLACEMENT

Tools Required:
No. 1 Phillips screwdriver, 12"
Tie wraps

Figure 2-7 Operator Brightness Potentiometer



1. Disconnect the terminal from its AC power source.
2. Remove four No. 1 Phillips screws holding the CRT cover in place.
3. Hold the CRT cover by both ends and pull it off.
4. Disconnect the brightness potentiometer wiring harness from the monitor/power supply PCB.

5. Clip the tie wraps holding the brightness potentiometer harness to the chassis.

6. Remove four No. 2 Phillips screws that hold the CRT bezel.

7. Remove the bezel.

8. Remove two No. 1 Phillips screws that hold the brightness potentiometer to the bezel.

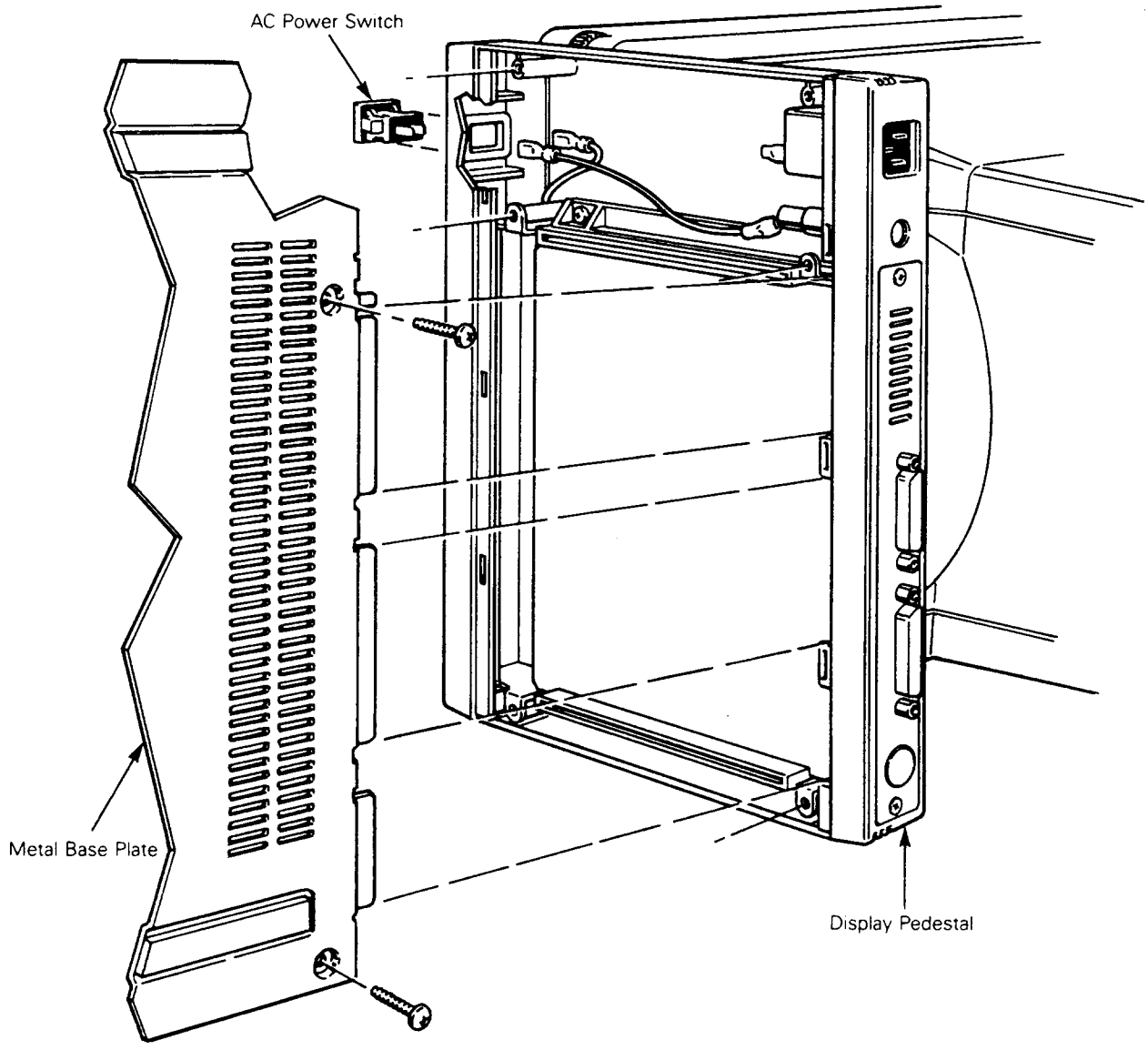
9. Install the new potentiometer.

10. Assemble the CRT in the reverse order from disassembly.

AC POWER SWITCH REPLACEMENT

Tools Required:
No. 1 Phillips screwdriver
Tie wraps

Figure 2-8 AC Power Switch Removal



1. Disconnect the terminal from its AC power source.
2. Lay the terminal on its side.
3. Remove six No. 1 Phillips screws that hold the metal base plate to the display pedestal.
4. Lift the metal base plate free.

CAUTION--The metal base plate tabs can break the display console plastic if they aren't handled carefully.

5. Disconnect the slip-on connectors from the rear of the switch.

6. Push the power switch out of the front of the display pedestal. This is a snap-in switch; you may have to squeeze the snaps to remove it.

7. Install the new switch.

8. Assemble in the reverse order from disassembly.

MICROPROCESSOR PCB REPLACEMENT

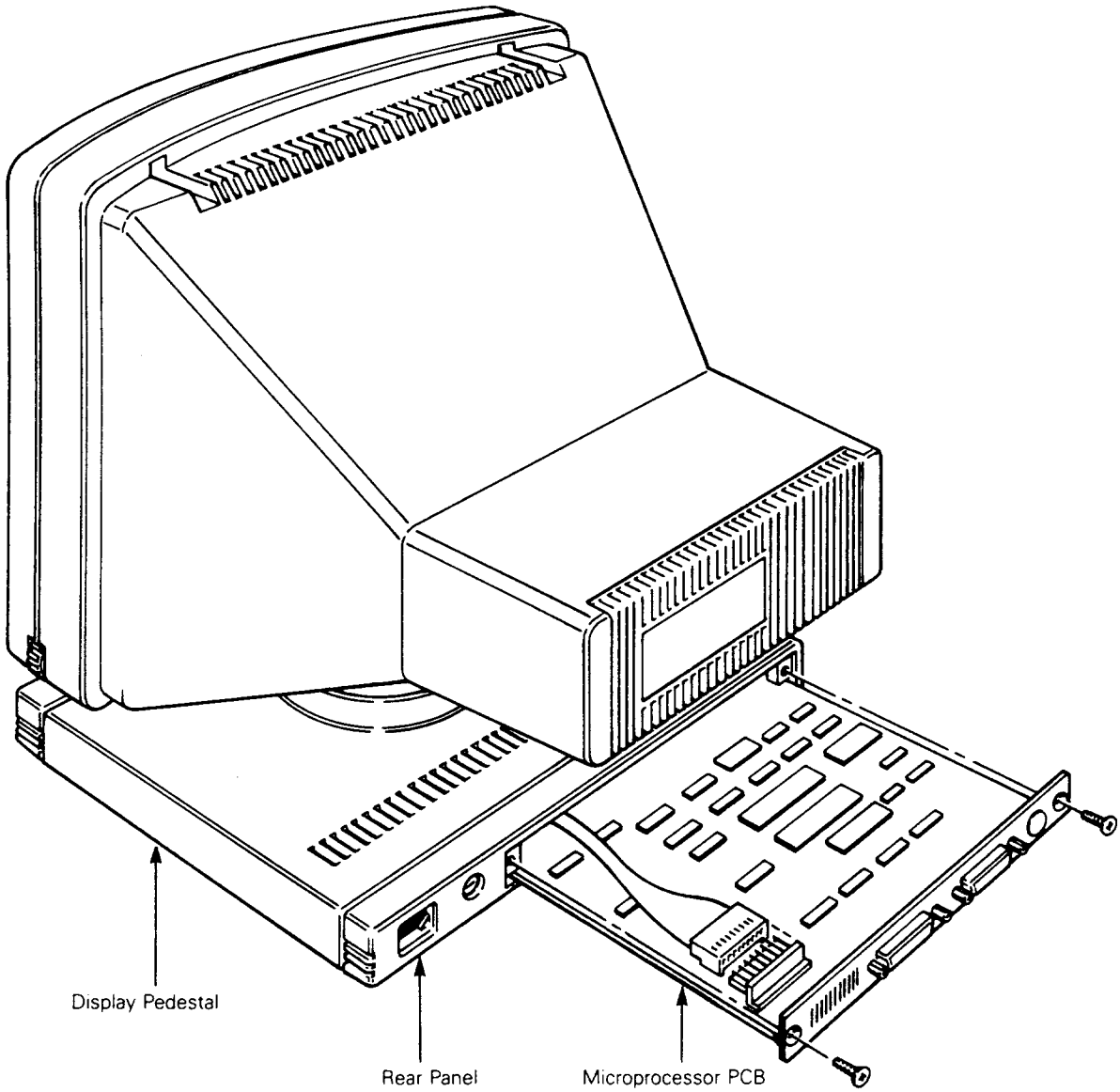
Tools required:
No. 1 Phillips screwdriver

See Figure 2-9.

1. Disconnect the terminal from its AC power source.

2. Disconnect the keyboard from the rear panel.

Figure 2-9 Microprocessor PCB Removal



3. Disconnect the printer and modem communications cables.

4. Remove two No. 1 Phillips screws holding the rear panel in place on the display pedestal.

5. Pull the rear panel 2 inches out of the unit.

6. Disconnect the monitor/power supply cable from the microprocessor PCB (Figure 2-9).

7. Remove the microprocessor PCB.

8. Install the new microprocessor PCB.

9. Assemble in the reverse order of disassembly.

3 TROUBLESHOOTING

INTRODUCTION

This terminal is easy to troubleshoot. Chapter 3 describes its self-test, diagnostics, and hardware problems. It also explains how to fix problems at the board level.

POWER-ON SELF-TEST

Note--Self-test returns the terminal to default values.

The power-on self-test checks the terminal's RAM, CPU, and EAROM. The RAM test is a Write/Read test that checks all 4K of RAM. The CPU test checks 128 bytes of RAM in the CPU as well as the data and address lines. The EAROM test calculates the EAROM's checksum and compares it to the checksum bit stored in the ROM.

Each time a user turns the terminal on, the power-on self-test executes. If the test detects an error, an error message appears in the lower right-hand corner of the display. Table 3-1 defines these error messages. If any of these messages do appear, replace the microprocessor board.

Table 3-1 Error Message Definitions

Error Message	IC Location	Definition
0	1E	RAM failure in the first 2K block
1	1D	RAM failure in the second 2K block
P	1J	Control PROM error
R	3F or 1C	Display row buffer error
9	6J (TTL PCB) 5J (Gate Array PCB)	EAROM checksum error
X	NA	MODEM port error
Y	NA	AUX port error
Z	3K	CPU failure

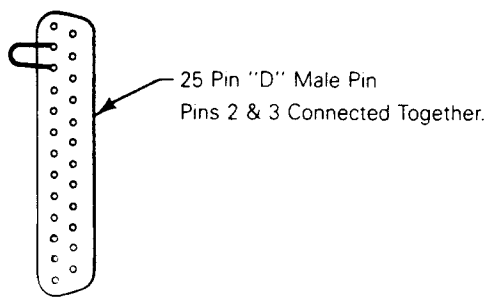
DIAGNOSTIC SELF-TEST

The you can start the terminal diagnostic self-test routine in setup. This test routine includes the power-on self-test and the telecommunications circuitry tests. Two special jumpers allow the communications test to function (see Figure 3-1 for jumper definitions). After you start it, the diagnostic test continues to run until you stop it. If the test detects an error, an error message appears in the lower right-hand corner of the CRT (see Table 3-1 for error message definitions).

Follow these steps to start the diagnostic self-test:

1. Plug in the terminal.
2. Install a test jumper on both the AUX and MODEM ports.
3. Turn the power switch ON.
4. Hold down SHIFT, then press SETUP.
5. Press ESC. This returns the terminal to default parameters.
6. Press ▼ key until the TEST parameter appears on the bottom row of the screen.
7. Press ► key until the cursor highlights the TEST parameter field.
8. Press the spacebar. This toggles the TEST parameter field to ON.
9. Start the self-test by holding SHIFT, while you press the SETUP and y keys. The test runs until you stop it.
10. To stop the self-test, hold down SHIFT, then press SETUP again, then remove the jumpers.

Figure 3-1 Test Jumper



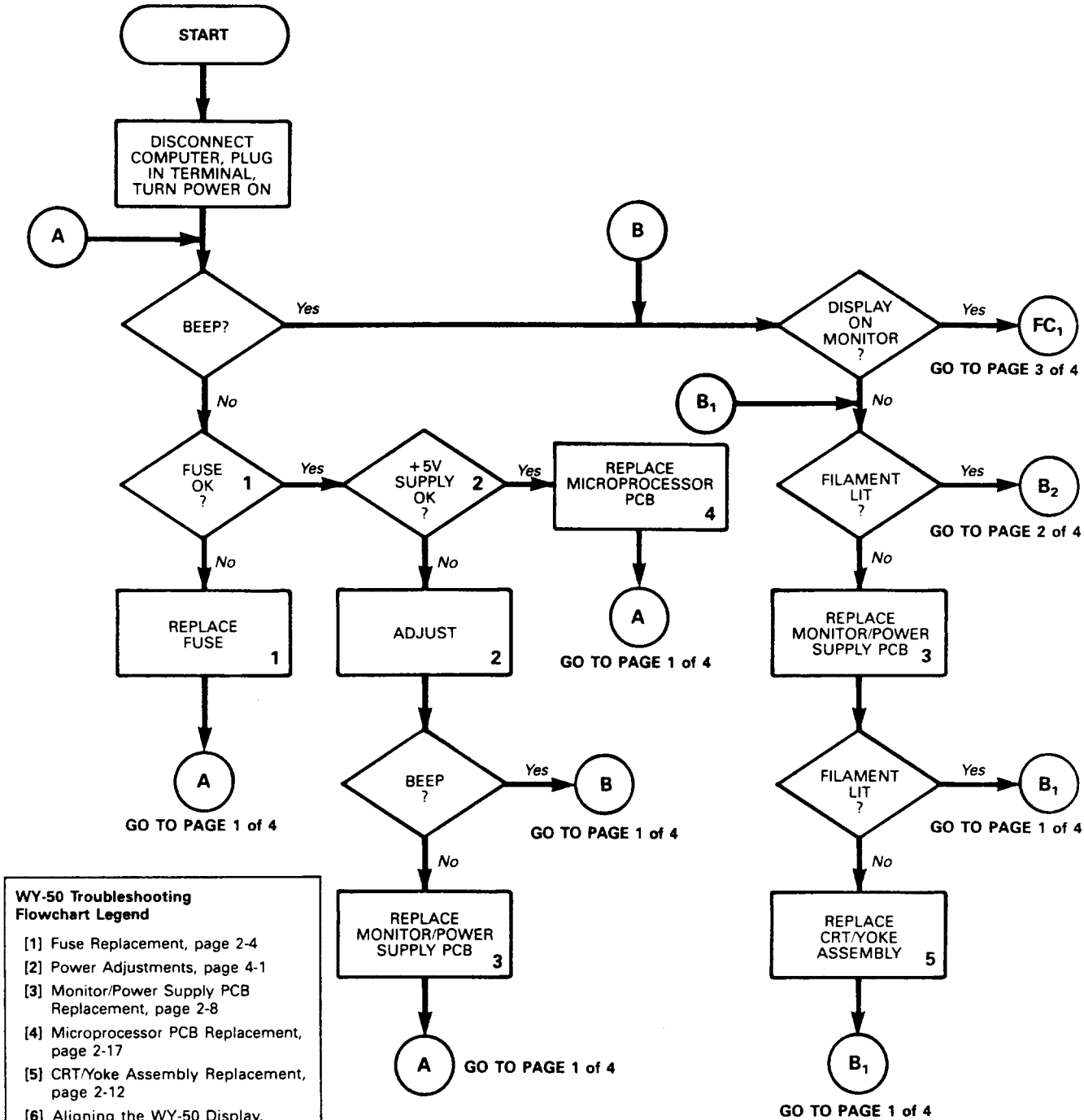
TROUBLESHOOTING

This section contains the troubleshooting flowchart, a power supply quick-reference procedure, a procedure to check the horizontal-synchronization signal, and a vertical-hold procedure for revision A monitor/power supply PCBs.

Troubleshooting Flowchart

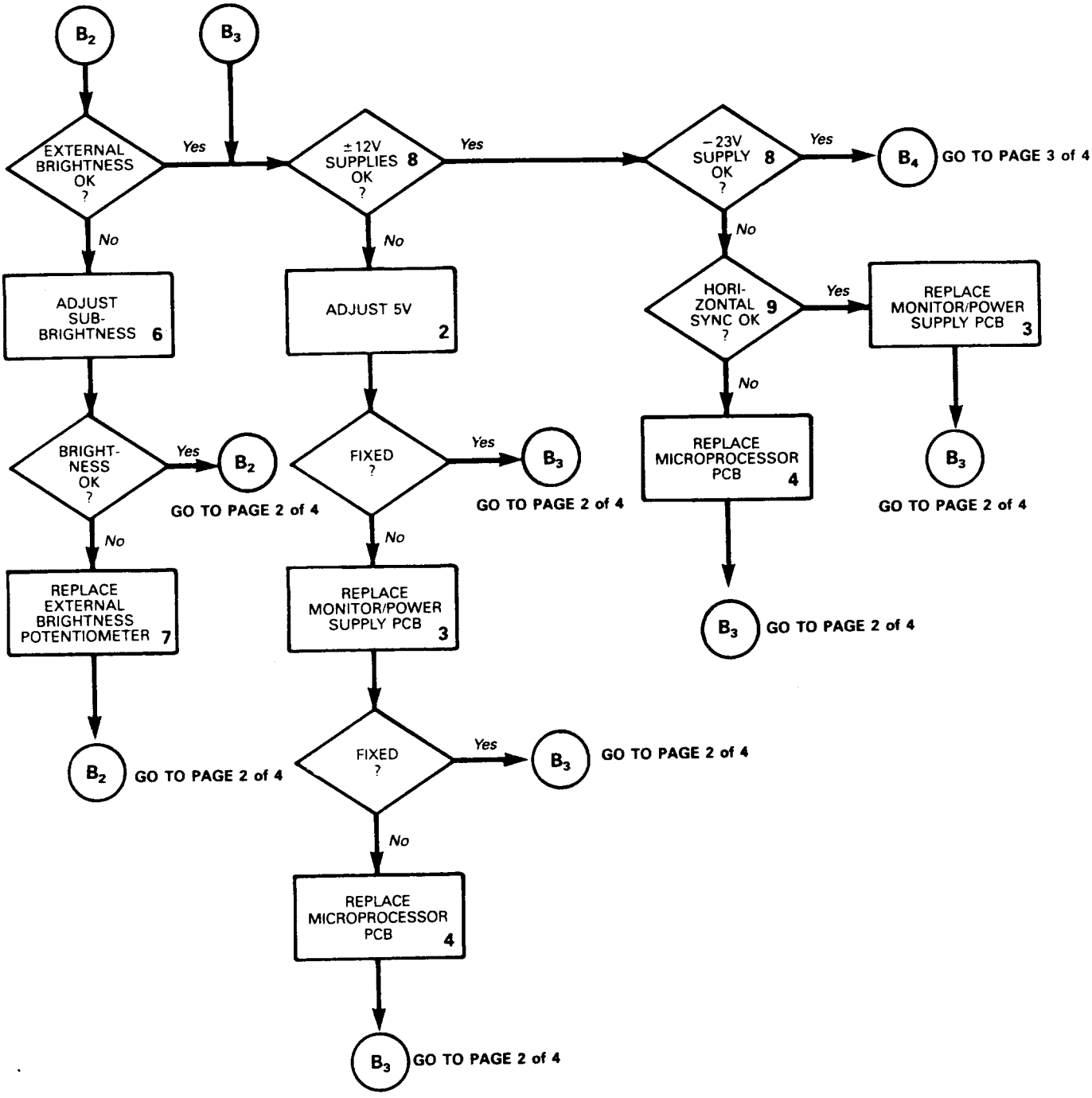
The troubleshooting flowchart can help you locate faulty modules. Start at the beginning, and follow the questions in the decision boxes. If any step requires a special procedure, you can find a reference number next to the block. We have keyed the reference numbers that appear in the flowchart to the legend at the bottom of the page. If the flowchart doesn't cover the symptoms the terminal shows, look at "Theory of Operations," Chapter 6 and Appendix C, "Schematics."

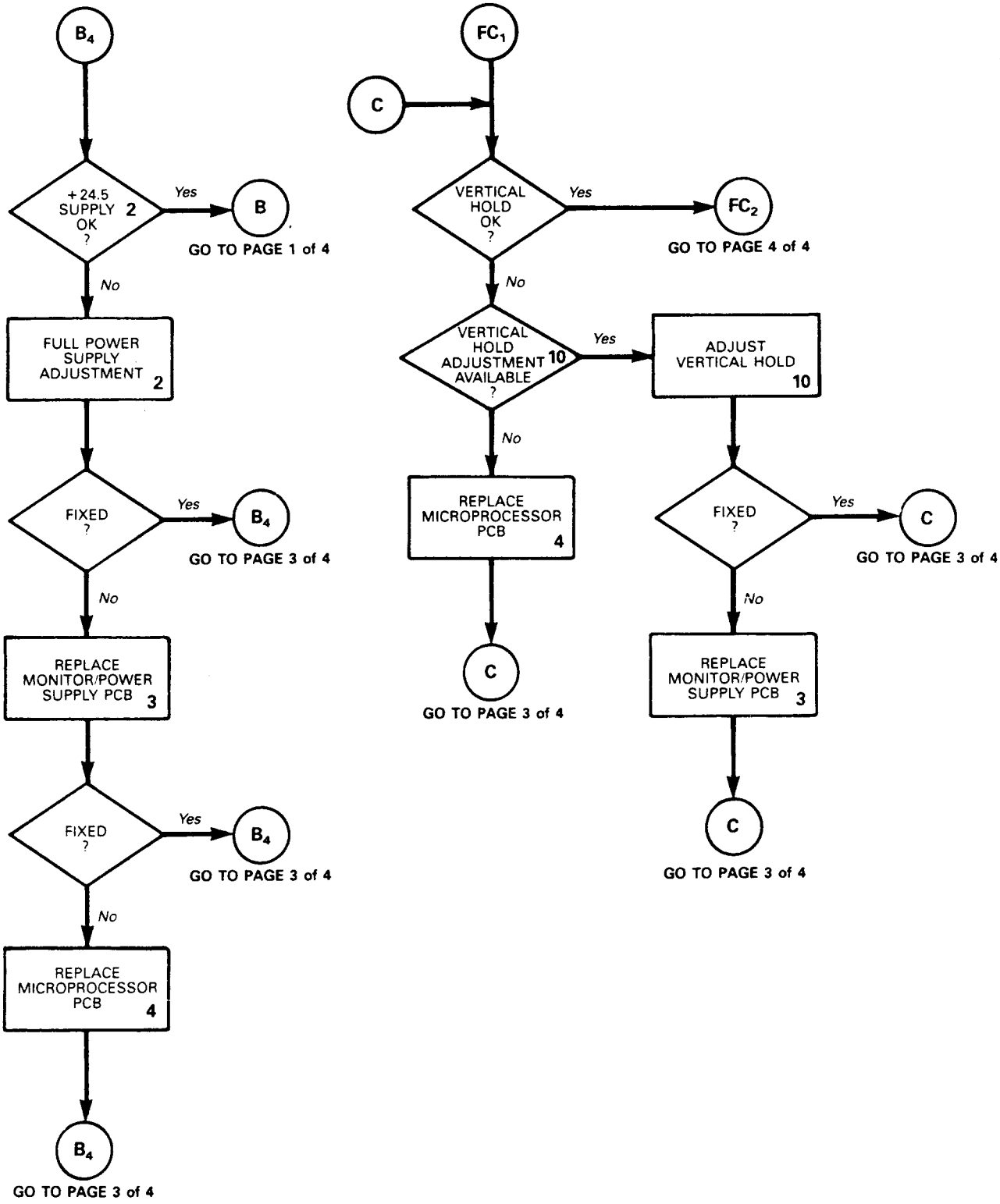
Figure 3-2 Troubleshooting Flowchart

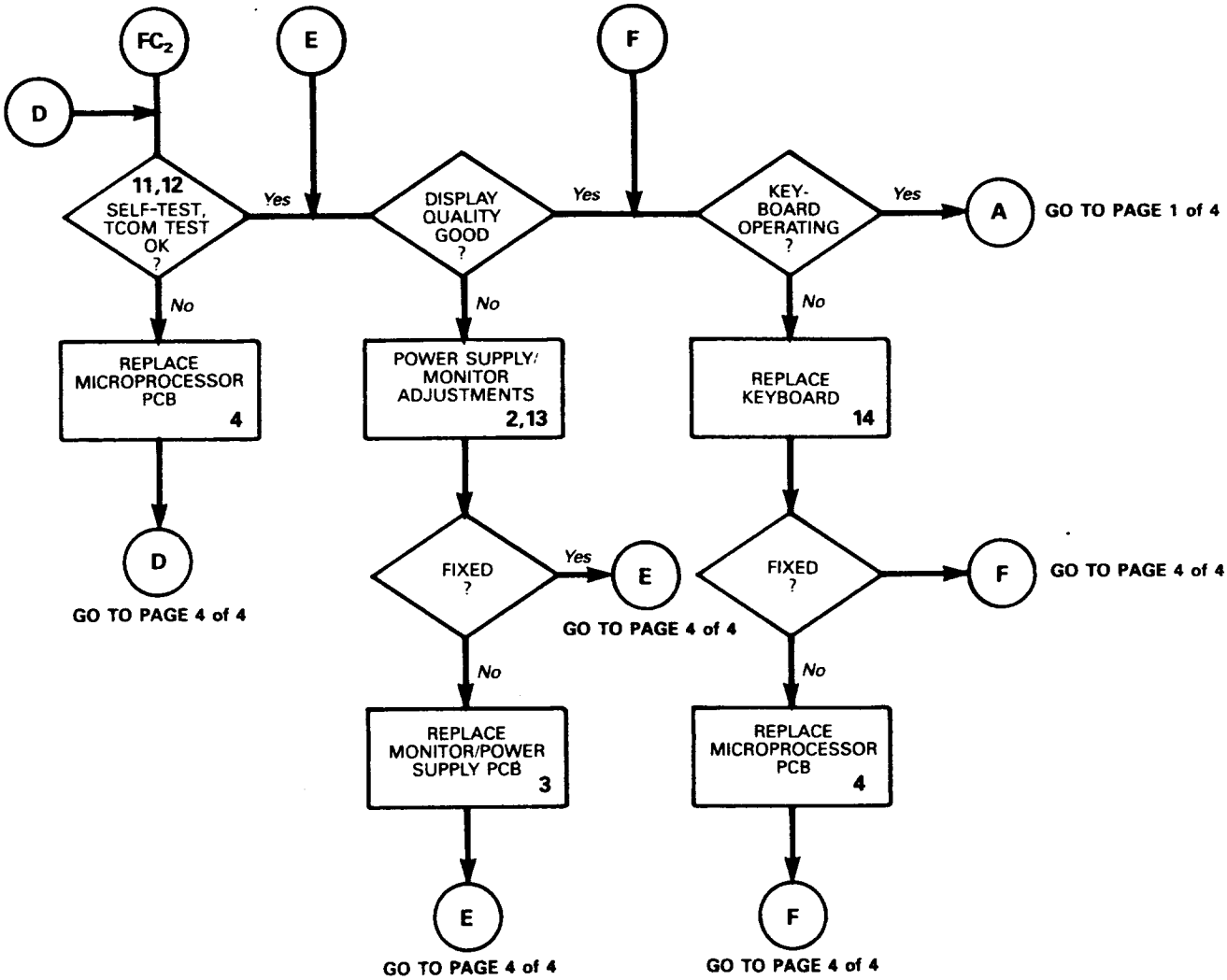


WY-50 Troubleshooting Flowchart Legend

- [1] Fuse Replacement, page 2-4
- [2] Power Adjustments, page 4-1
- [3] Monitor/Power Supply PCB Replacement, page 2-8
- [4] Microprocessor PCB Replacement, page 2-17
- [5] CRT/Yoke Assembly Replacement, page 2-12
- [6] Aligning the WY-50 Display, page 4-4
- [7] Brightness Potentiometer Replacement, page 2-14
- [8] Power Supply Check from the Microprocessor PCB, page 3-8
- [9] Checking Horizontal Synchronization, page 3-9
- [10] Adjusting Vertical Hold, page 3-9
- [11] Power-On Self-Test, page 3-1
- [12] Diagnostic Self-Test, page 3-2
- [13] Display Alignments and Adjustments, page 4-1
- [14] Keyboard Replacement, page 2-5


B2
B3
EXTERNAL BRIGHTNESS OK ?
Yes
No
±12V SUPPLIES OK ? 8
Yes
No
−23V SUPPLY OK ? 8
Yes
B4
GO TO PAGE 3 of 4
ADJUST SUB-BRIGHTNESS 6
ADJUST 5V 2
HORI-ZONTAL SYNC OK ? 9
Yes
REPLACE MONITOR/POWER SUPPLY PCB 3
No
BRIGHT-NESS OK ?
Yes
B2
GO TO PAGE 2 of 4
No
FIXED ?
Yes
B3
GO TO PAGE 2 of 4
No
REPLACE MICROPROCESSOR PCB 4
B3
GO TO PAGE 2 of 4
B3
GO TO PAGE 2 of 4
REPLACE EXTERNAL BRIGHTNESS POTENTIOMETER 7
REPLACE MONITOR/POWER SUPPLY PCB 3
B2
GO TO PAGE 2 of 4
FIXED ?
Yes
B3
GO TO PAGE 2 of 4
No
REPLACE MICROPROCESSOR PCB 4
B3
GO TO PAGE 2 of 4


B4
+24.5 SUPPLY OK ? 2
Yes
B
GO TO PAGE 1 of 4
No
FULL POWER SUPPLY ADJUSTMENT 2
FIXED ?
Yes
B4
GO TO PAGE 3 of 4
No
REPLACE MONITOR/POWER SUPPLY PCB 3
FIXED ?
Yes
B4
GO TO PAGE 3 of 4
No
REPLACE MICROPROCESSOR PCB 4
B4
GO TO PAGE 3 of 4
FC1
C
VERTICAL HOLD OK ?
Yes
FC2
GO TO PAGE 4 of 4
No
VERTICAL HOLD ADJUSTMENT AVAILABLE ? 10
Yes
ADJUST VERTICAL HOLD 10
No
REPLACE MICROPROCESSOR PCB 4
C
GO TO PAGE 3 of 4
FIXED ?
Yes
C
GO TO PAGE 3 of 4
No
REPLACE MONITOR/POWER SUPPLY PCB 3
C
GO TO PAGE 3 of 4

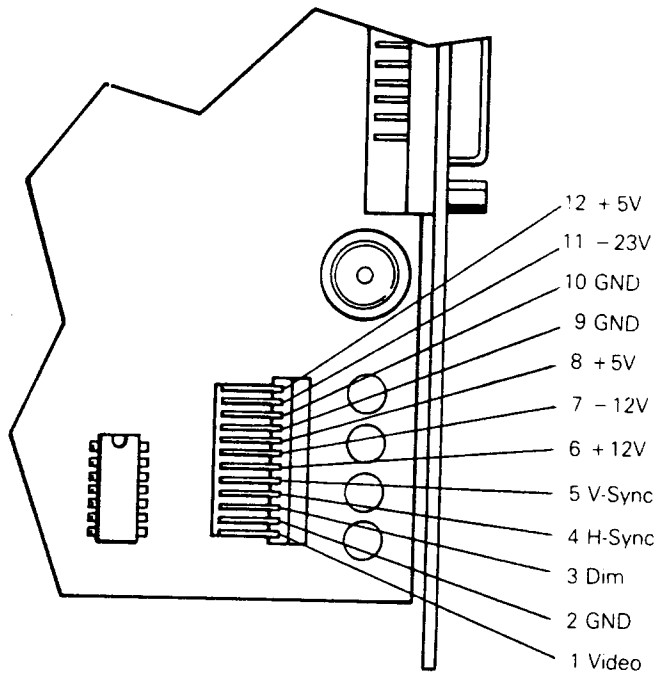

FC2
E
F
D
11,12
SELF-TEST, TCOM TEST OK ?
Yes
DISPLAY QUALITY GOOD ?
Yes
KEY-BOARD OPERATING ?
Yes
A
GO TO PAGE 1 of 4
No
No
No
REPLACE MICROPROCESSOR PCB
4
POWER SUPPLY/ MONITOR ADJUSTMENTS
2,13
REPLACE KEYBOARD
14
D
GO TO PAGE 4 of 4
FIXED ?
Yes
E
GO TO PAGE 4 of 4
FIXED ?
F
GO TO PAGE 4 of 4
No
No
REPLACE MONITOR/POWER SUPPLY PCB
3
REPLACE MICROPROCESSOR PCB
4
E
GO TO PAGE 4 of 4
F
GO TO PAGE 4 of 4

Power Supply Check from the Microprocessor PCB

You can quickly isolate problems if you check voltages on the microprocessor board. If all voltages at connector J4 are within tolerance, the microprocessor board is at fault (Figure 3-3). If they aren't within tolerance, go to "Adjustments and Alignments," Chapter 4, and adjust the power supply. If you can't adjust the power supply to meet the tolerances, you may need to replace it.

For quick reference, you can check four of the five power supply voltages on the microprocessor board without opening the cover on the monitor (the fifth, +24.5V, never reaches the microprocessor PCB).

Figure 3-3 Power Connector at the Microprocessor PCB



Tools required:
Voltmeter, Phillips screwdriver

1. Turn the monitor OFF.

2. Remove two No. 1 Phillips screws holding the rear panel in place. Pull the microprocessor PCB two inches out of the unit.

3. Find connector J4 on the microprocessor board.

4. Attach one lead from the DVM to J4-10, ground.

5. Turn the monitor on.

6. Check the +5V power supply on J4-12. Look for +5V, ±2 percent. See the troubleshooting flowchart if the signal isn't within tolerance.

7. Check the +12V power supply on J4-6. Look for +12V, ±5 percent. See the troubleshooting flowchart if the signal isn't within tolerance.

8. Check the -12V power supply on J4-7. Look for -12V, ±5 percent. See the troubleshooting flowchart if the signal isn't within tolerance.

9. Check the -23V power supply on J4-11. Look for -23V, ±5 percent. See the troubleshooting flowchart if the signal isn't within tolerance.

Checking Horizontal Synchronization

Checking the horizontal synchronization helps determine which PCB to replace: either the microprocessor PCB or the monitor/power supply PCB.

Tools Required:
Oscilloscope

1. Find connector J4 on the microprocessor PCB (see Figure 3-3).

2. Touch J4-4 with the oscilloscope probe. Look for a 44 µs, ±10 percent, pulse, 4.8 to 5Vp-p. If the horizontal synchronization signal is within tolerance, replace the monitor/power supply PCB. If it isn't within tolerance, replace the microprocessor PCB. See the troubleshooting flowchart.

Adjusting Vertical Hold

On a few early terminals, the monitor/power supply PCB has an extra potentiometer to adjust vertical hold. You can find it next to HGT, VR302, directly below the anode cap. If you need to adjust it, this is the procedure:

1. Display a full screen of E's (see "Adjustments and Alignments," Chapter 4).

2. Turn the vertical hold potentiometer until the display rolls in one direction.

3. Turn the vertical hold potentiometer until the display rolls in the other direction.

4. Center the potentiometer; the display should be steady. If it isn't steady, see the troubleshooting flowchart.

4 ADJUSTMENTS AND ALIGNMENTS

This chapter describes adjustments and alignments for the terminal. In particular, it discusses power adjustments, and monitor alignment and adjustments. Before you align the monitor, check the power supply voltages. Adjust them if they aren't in tolerance. You should complete a full monitor/power supply adjustment and alignment whenever you replace the monitor/power supply PCB or the CRT/yoke assembly.

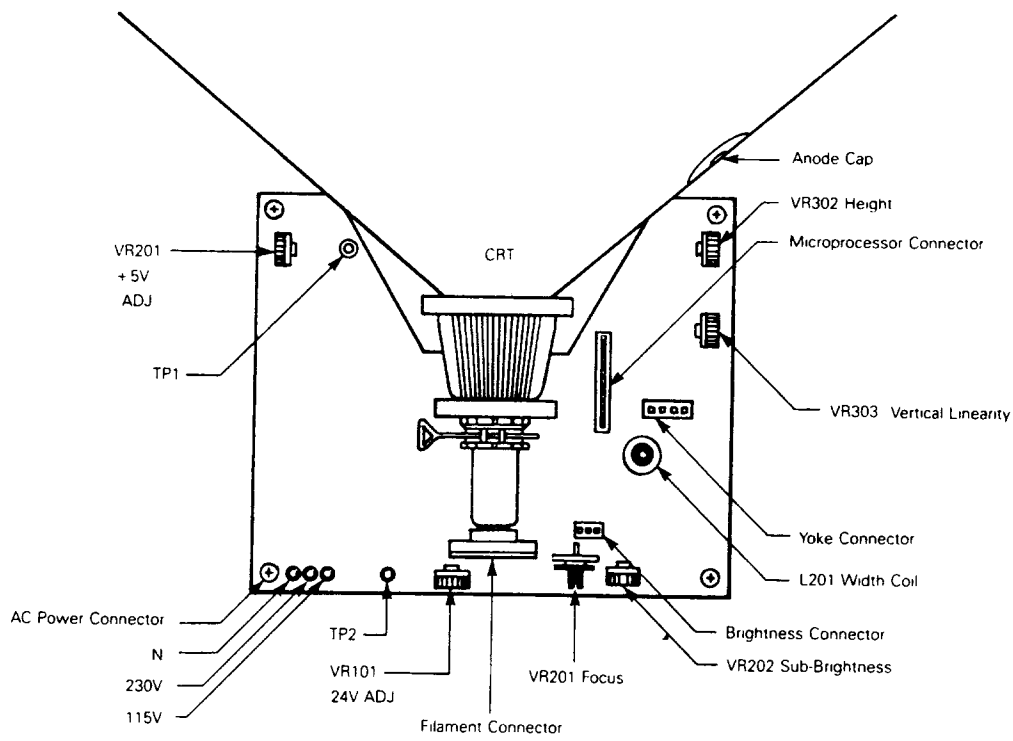
WARNING--CRT/yoke has high voltages. Only qualified service personnel should adjust it.

POWER ADJUSTMENTS

The monitor/power supply PCB provides all of the voltages for the microprocessor PCB (+5V, -12V, +12V, and -23V). It also supplies +24.5V for the CRT monitor. You can adjust the +24.5V and +5V supplies.

Note--You can find the locations of all components and test points referred to in this chapter in Figure 4-1.

Figure 4-1 Monitor/Power Supply Component Layout



Tools Required:
No. 1 Phillips screwdriver voltmeter
Nonconductive alignment tool

1. Turn the terminal OFF.

2. Unplug the terminal from its power source. If communications cables are attached to the back of the terminal, detach those too.

3. Remove the four No. 1 Phillips screws that hold the CRT cover in place (one in each corner).

4. Gently pull the CRT cover up and away from the terminal.

5. Plug the terminal into a power source.

6. Turn the terminal ON.

7. Check the +5V supply at TP1 on the monitor/power supply PCB, using the chassis as ground.

Note--The monitor/power supply PCB holds two VR201 components. Look for the VR201 in the left front of the PCB to adjust the power supply voltages.

8. Adjust VR201 until the digital voltmeter reads +5V ±2 percent.

9. Check the +24.5V supply at TP2 on the monitor/power supply PCB, using the chassis as ground.

10. Adjust VR101 until the digital voltmeter reads +24.5V ±2 percent.

Note--If you can't bring either the +5V supply or the +24.5V supply into tolerance, see "Troubleshooting," Chapter 3.

11. Check the -12V supply at the gray wire on JP3.7 (microprocessor board wiring harness). The digital voltmeter should read -12V ±5 percent. If the -12V supply is not within tolerance after you have adjusted the +5 and +24.5V supplies, see "Troubleshooting," Chapter 3.

12. Check the +12V supply at the blue wire on JP3.6 (microprocessor board wiring harness). The digital voltmeter should read +12V ±5 percent. If the +12V supply is not within tolerance after you have adjusted the +5 and +24.5V supplies, see "Troubleshooting," Chapter 3.

13. Check the -23V supply at the purple wire on JP3.11 (microprocessor board wiring harness). The digital voltmeter should read -23V ±5 percent. If the -23V supply is not within tolerance after you have adjusted the +5 and

+24.5V supplies, see "Troubleshooting," Chapter 3.

14. Check to see if the display needs alignment. See "Does the Terminal Meet the Display Specification?" If it doesn't need alignment, turn the terminal OFF, unplug it, and replace the top cover.

    If the display does need alignment, continue to "Aligning the Terminal Display."

Does the Terminal Meet the Display Specification?

Before you adjust the display on the monitor, measure the screen margins and study the display. Use the following procedures:

Note--If you have just finished checking and adjusting the power supplies, go to step 4.

Tools Required:
- Millimeter ruler
- Nonconductive alignment tool

1. Turn the terminal OFF.
2. Detach any communications cables from the back of the terminal.
3. Turn the terminal ON.
4. Hold down SHIFT, then press BREAK on the terminal keyboard. You should see BLK displayed above the status line. If you see anything else, hold down SHIFT, then press BREAK again until you see BLK.
5. Press ESC . (period).
6. Then press E. This displays 24 rows of E (an excellent test pattern for display alignment).
7. Hold down SHIFT, then press SETUP. This adds lines 0 and 25.
8. Margins on the top, bottom, and both sides should measure 12mm ±3mm. If they don't, see the next section.
9. Look at the display. If there is barreling or pincushioning; if the letters on the top aren't the same size as letters on the bottom; if any of the display edges aren't straight; or, if there are brightness or focus problems, see "Aligning the Terminal Display."
10. If the display is within specification and looks regular, turn off the terminal. Now you can close the terminal and reattach the communications and power cables.

Aligning the Terminal Display

The monitor has several alignments and adjustments. Perform these procedures only if the display is out of tolerance and doesn't match the specification.

WARNING--The CRT/yoke assembly has high voltages. Only qualified service personnel should perform adjustments to it.

Tools Required:
- No. 1 Phillips screwdriver
- Nonconductive alignment tool

Note--If you already have an E alignment pattern on the screen, go to step 5. This procedure assumes that you have just checked or adjusted the power supply voltages, the top cover is off, and the power is ON.

1. Hold down SHIFT, then press BREAK on the terminal keyboard. You should see BLK displayed above the status line. If you see anything else, hold down SHIFT, then press BREAK again until you see BLK.
2. Press ESC . (period).
3. Press E. This displays 24 rows of E.
4. Hold down SHIFT, then press SETUP. This adds lines 0 and 25.
5. Look at the display, then at Table 4-1. Table 4-1 lists display problems, the adjustments that fix them, and where to go for further instructions.

Table 4-1 Problems and Adjustments

Display Problems	Adjustments
Display too short or too tall	Height, p. 4-6
Letters at the top of the display aren't the same height as those at the bottom of the display	Linearity, p. 4-6
Fuzzy letters	Focus, p. 4-6
Too wide or too narrow	Width, p. 4-6
Not centered	Yoke Lock, p. 4-7
Too bright, too dim,	Sub-Brightness,

raster scan lines show	p. 4-9
Pincushioning, barreling, crooked edges, corners that sag or move out of specification	Display Magnets, p. 4-9

6. Adjust the display. Check Figure 4-1 for component locations.

Note--If you finish both the power and display adjustments, and the display is still not within tolerance, see "Troubleshooting," Chapter 3.

7. When the display is within specification, and looks regular, turn off the terminal. Now you can close the terminal and reattach communications and power cables.

ADJUSTMENTS

Height

The height adjustment is labeled HGT VR302 on the monitor/power supply board.

Adjust VR302 until the top edge and the bottom edge of the display are both 12mm ±3mm from the edge of the bezel.

Linearity

The linearity adjustment is labeled LIN VR303 on the monitor/power supply board.

Adjust VR303 until characters on the bottom of the display are the same height as those on the top.

Focus

Note--Do not use the focus control to adjust the outer extremities of the screen. Some focus distortion happens in all CRTs.

The focus adjustment is labeled FOCUS VR201 on the monitor/power supply board.

Adjust VR201 until the characters halfway between the center of the display and the bezel are distinct and clear.

Width

CAUTION--Do not use a metal tool to adjust the width coil. The magnetic properties of a metal tool will affect the adjustment.

The width adjustment is labeled L201 on the monitor/power supply board.

Adjust L201 until either side of the display is 12mm ±3mm from the edge of the bezel.

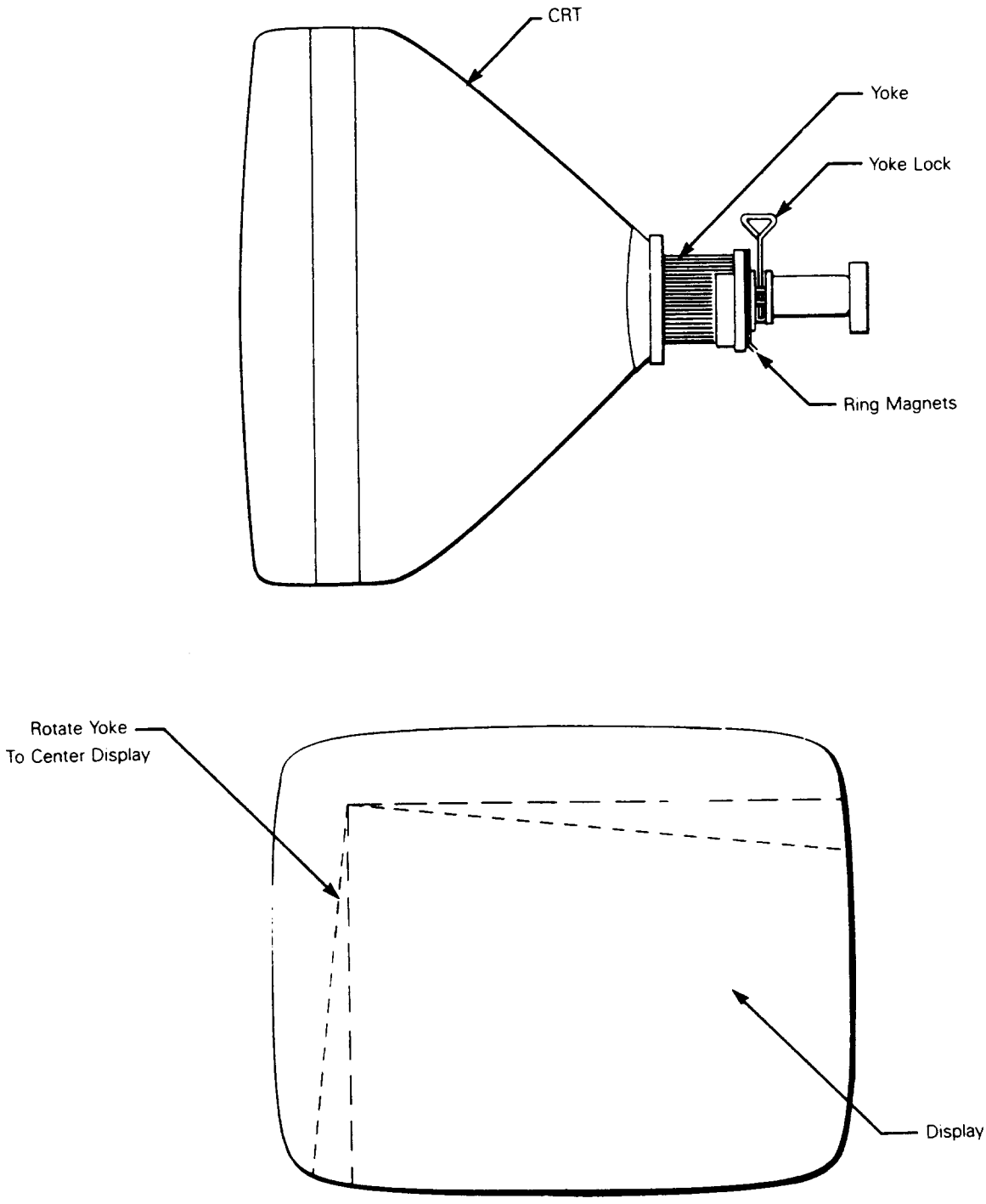
Yoke Lock

CAUTION--Do not tighten the yoke lock too much or the neck of the CRT will break.

The yoke lock is located on the neck of the CRT (See Figure 4-2).

- Loosen the yoke lock on the neck of the CRT.
- Rotate the yoke until the display is centered.
- Tighten the yoke lock.

Figure 4-2 Yoke Lock on the CRT Neck



Sub-Brightness

The Sub-brightness potentiometer is labeled SUB-B on the monitor/power supply board.

- Turn the operator brightness control as far clockwise as possible.
- Turn SUB-B on the monitor/power supply board as far counterclockwise as possible. You should see the raster lines on the screen.
- Slowly turn SUB-B clockwise, just until the raster is no longer visible.

Display Magnets

There are eight display magnets on a ring around the yoke. When turned, they change the screen area they correspond to. They can also affect adjacent areas. Figure 4-3 identifies each magnet; Table 4-2 identifies which portion of the screen each changes.

Figure 4-3 Display Magnets

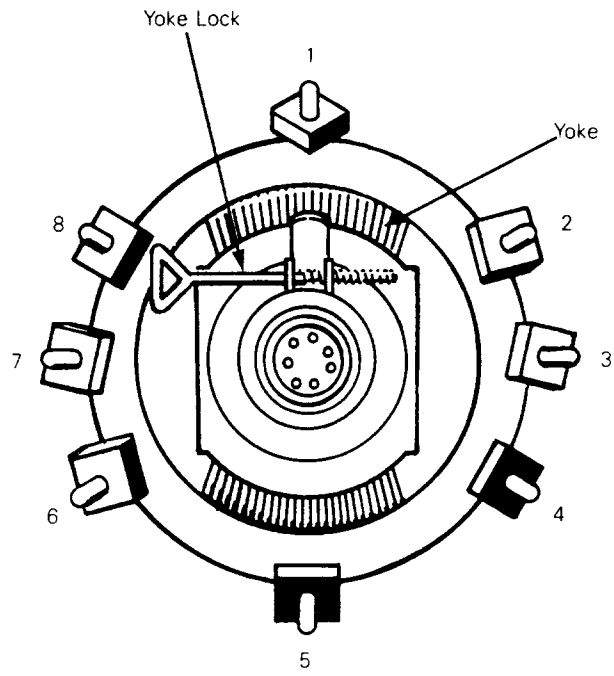


Table 4-2 Screen Areas Affected by Display Magnets

Magnet Number	Area Affected
1	Top
2	Upper left corner
3	Left
4	Lower left corner
5	Bottom
6	Lower right corner
7	Right
8	Upper right corner

5 ILLUSTRATED PARTS LIST

This chapter provides the information you need to order parts for the WY-50 terminal.

You will find numbered parts lists opposite each assembly drawing in this chapter. The item numbers correspond to the numbers in the circles on the assembly drawings. The part name indicates Wyse's description of the part. The part number is the official Wyse stock number. When you order replacement parts, please use both the part name and part number.

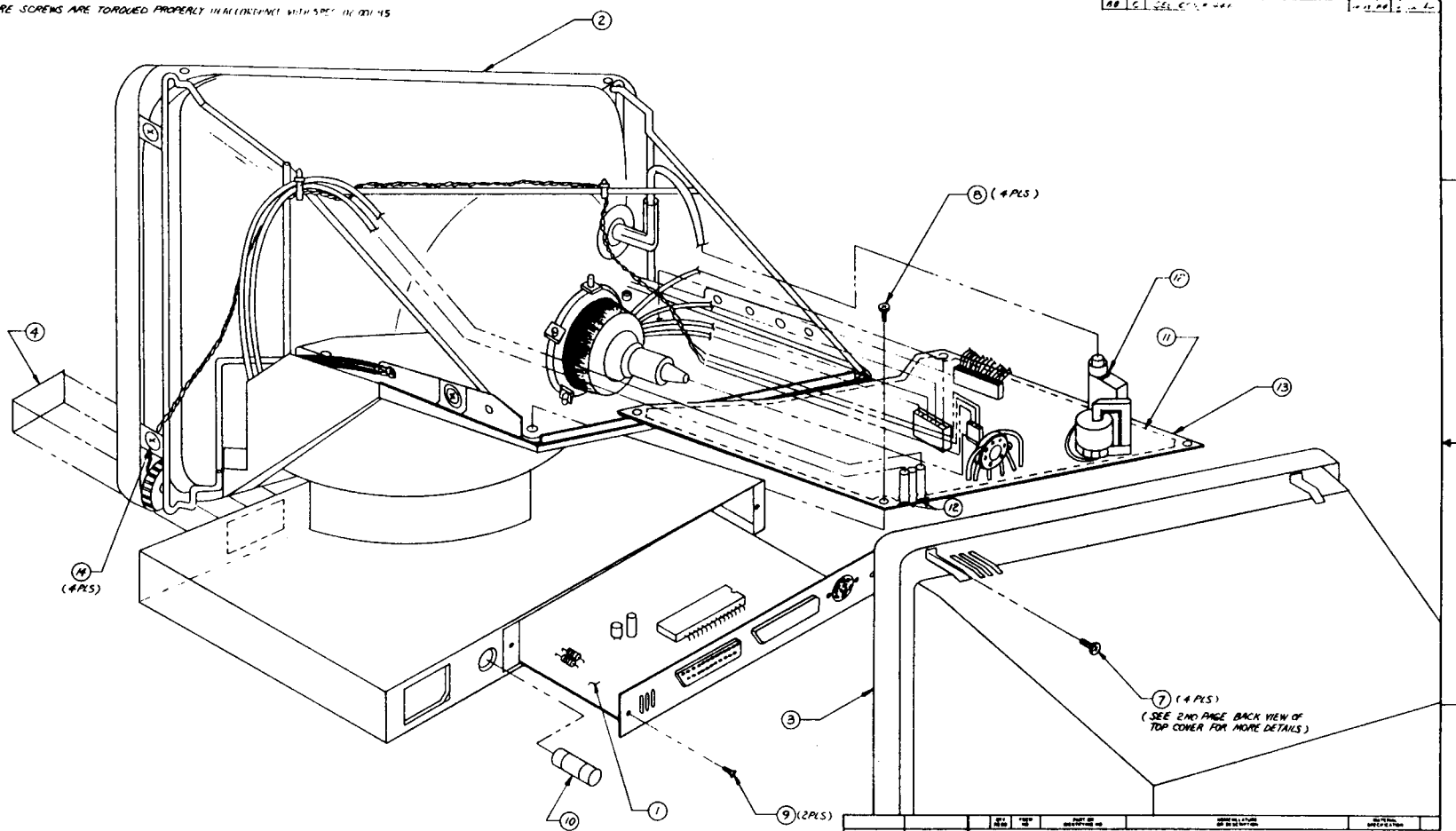
WY-50 Display Assembly Parts List

Item	Part Name	Part
1.	WY-50 Logic PCB (Microprocessor PCB, gate array)	32-005-02
2.	WY-50 Display Assembly	32-006-01
3.	WY-50 Top Cover	44-002-03
4.	WYSE Plate with adhesive	44-009-03
5.	Label, 115 VAC (domestic)	45-006-03
	Label, 220 VAC (international)	45-006-04
6.	Label, "REV B"	45-013-02
7.	Screw, CBM M4 x 8	50-005-21
8.	Screw, CBM M3 x 6	50-005-22
9.	Screw, CFM M3 x 5, black	50-005-57
10.	Fuse, 2 amp, 250V, fast blow	80-009-08
11.	PVC sheet, 188 x 160mm	80-806-09
12.	Adhesive, silicone rubber	82-002-04
13.	WY-50 Monitor/Power Supply PCB	99-019-01

NOTES :

1. MAKE SURE PROPER MODEL NUMBER AND REVISION ARE STAMPED HERE
2. MAKE SURE SCREWS ARE TORQUED PROPERLY IN ACCORDANCE WITH SPEC [illegible]

REV	DESCRIPTION	DATE	APPROVED
B/C	MANUFACTURING RELEASE PER ECN # 458	[illegible]	[illegible]
B	SEE ECN # [illegible]	[illegible]	[illegible]
A/B	C SEE ECN # [illegible]	[illegible]	[illegible]



00-051-01			
3C-156-01	WY-5C		

PARTS LIST

APPLICATION

THIRD ANGLE PROJECTION

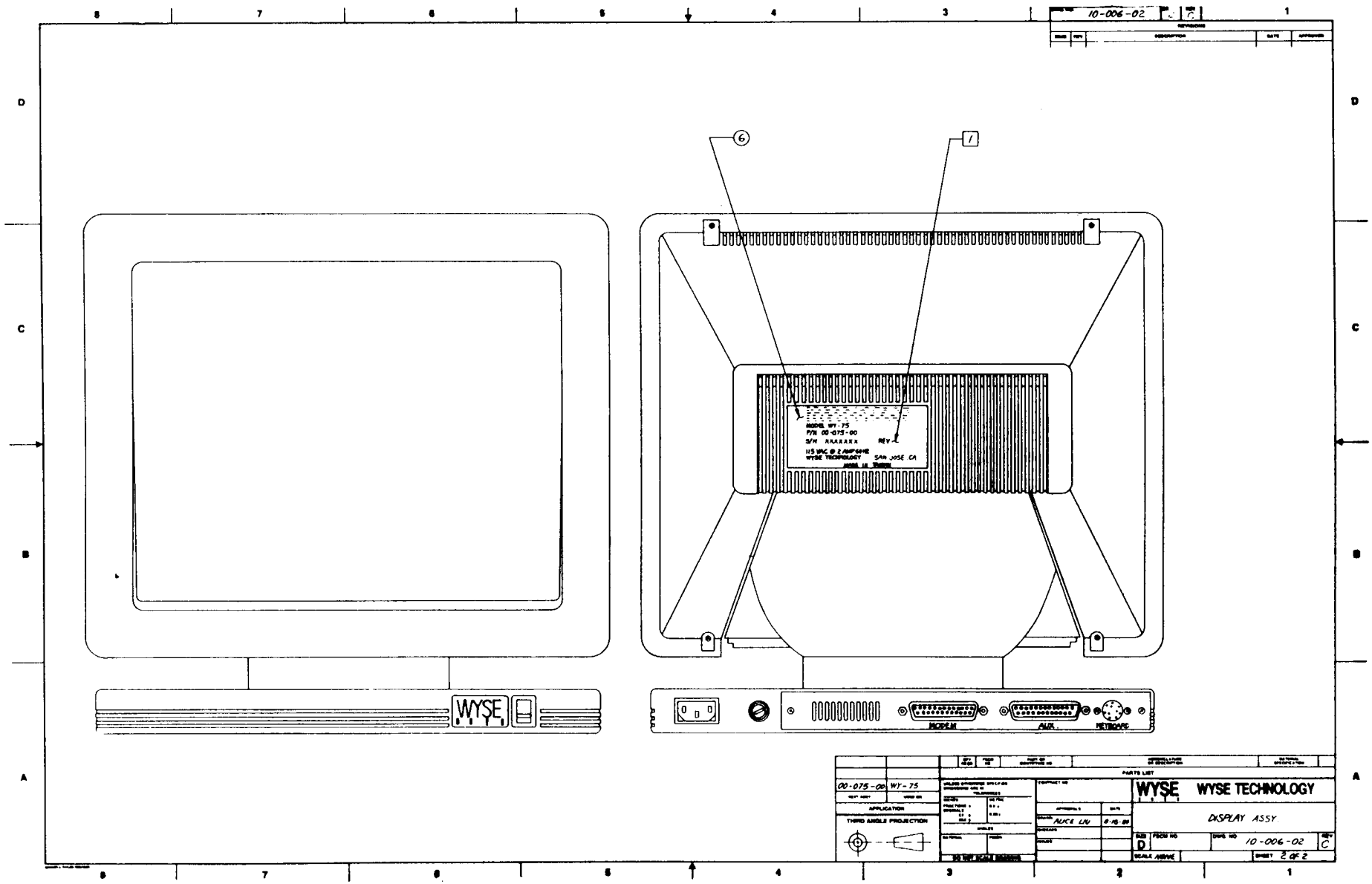
DO NOT SCALE DRAWING

WYSE WYSE TECHNOLOGY

WY-5C DISPLAY ASY

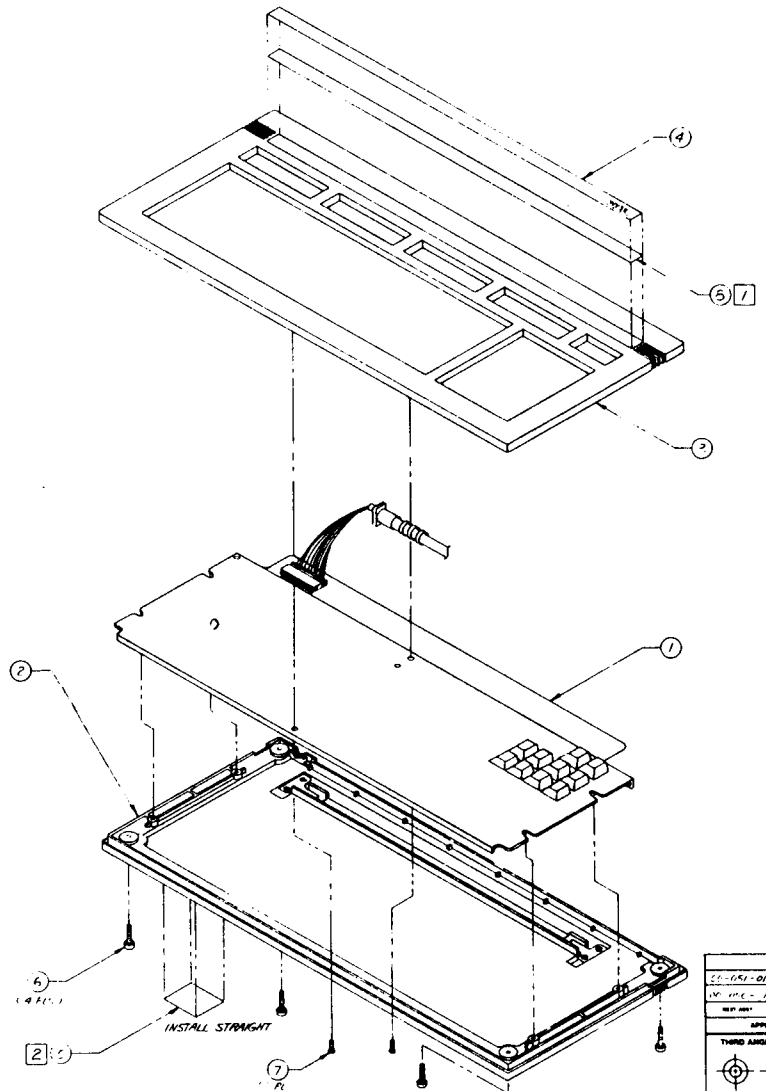
SIZE D | DWG NO [illegible] | REV C

SCALE [illegible] | SHEET [illegible]


10-006-02
C
DESCRIPTION
DATE
APPROVED
6
1
MODEL WY-75
P/N 00-0172-00
S/N XXXXXXX
REV C
115 VAC @ 2 AMPS MAX
WYSE TECHNOLOGY
SAN JOSE CA
MADE IN TAIWAN
WYSE
MODEM
AUX
NETWORK
00-075-00 WY-75
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
PARTS LIST
WYSE TECHNOLOGY
DISPLAY ASSY
ALICE LIN
8-15-89
SIZE D
DRAWING NO 10-006-02
REV C
SCALE NONE
SHEET 2 OF 2

WY-50 Keyboard Assembly Parts List

Item	Part Name	Part
1.	WY-50 Keyboard with Cable	32-008-01
2.	Keyboard Bottom Cover	32-009-01
3.	WY-50 Keyboard Top Cover	44-003-02
4.	WY-50 Keyboard Label	45-007-01
5.	WY-50 Keyboard Serial No. Label	45-008-01
6.	Screw, CBM M4 x 8	50-005-21
7.	Screw, CBM M4 x 6	50-005-71
8.	Tape, double sided,	82-003-03



WYSE TECHNOLOGY

WY-50 KEYBOARD ASSY

DWG NO 10-007-01

SIZE D

REV C

SHEET 1 OF 1

THIRD ANGLE PROJECTION

DO NOT SCALE DRAWING

6 THEORY OF OPERATIONS

INTRODUCTION

This section describes the terminal's basic logic functions. For technicians unfamiliar with raster scan techniques, a brief explanation of terms is given below.

RASTER SCAN TERMINOLOGY

The terminal has a 14-inch cathode ray tube (CRT) display. Because the terminal is a video display, most of its circuitry provides appropriate inputs for the CRT (i.e., clocks and video information).

An electron beam sweeps the face of the CRT. The CRT displays data by controlling this beam. The electron beam begins in the upper left-hand corner of the display and sweeps from left to right. One sweep of the beam is called a **scan line**. When the beam returns from the right side of the screen to the left side, beginning the next scan line, it must be **disabled** (turned off). This prevents a streak from appearing on the face of the CRT. Disabling the beam is called **horizontal blanking**. At the end of 338 scan lines, the electron beam arrives at the lower right-hand corner of the display. In order to return to the upper left-hand corner, the beam must be **disabled** again so a vertical streak doesn't appear on the face of the CRT. Disabling the beam at this time is called **vertical blanking**. The amount of time it takes the beam to move from the upper left-hand corner of the display and return is a **field**. By convention, field time normally equals the period of the AC power source [e.g., in the United States, field time is 1/60 of a second (60 Hz) and in Europe, 1/50 of a second (50 Hz)]. The terminal uses a 60 Hz field rate in either 60 Hz or 50 Hz AC input.

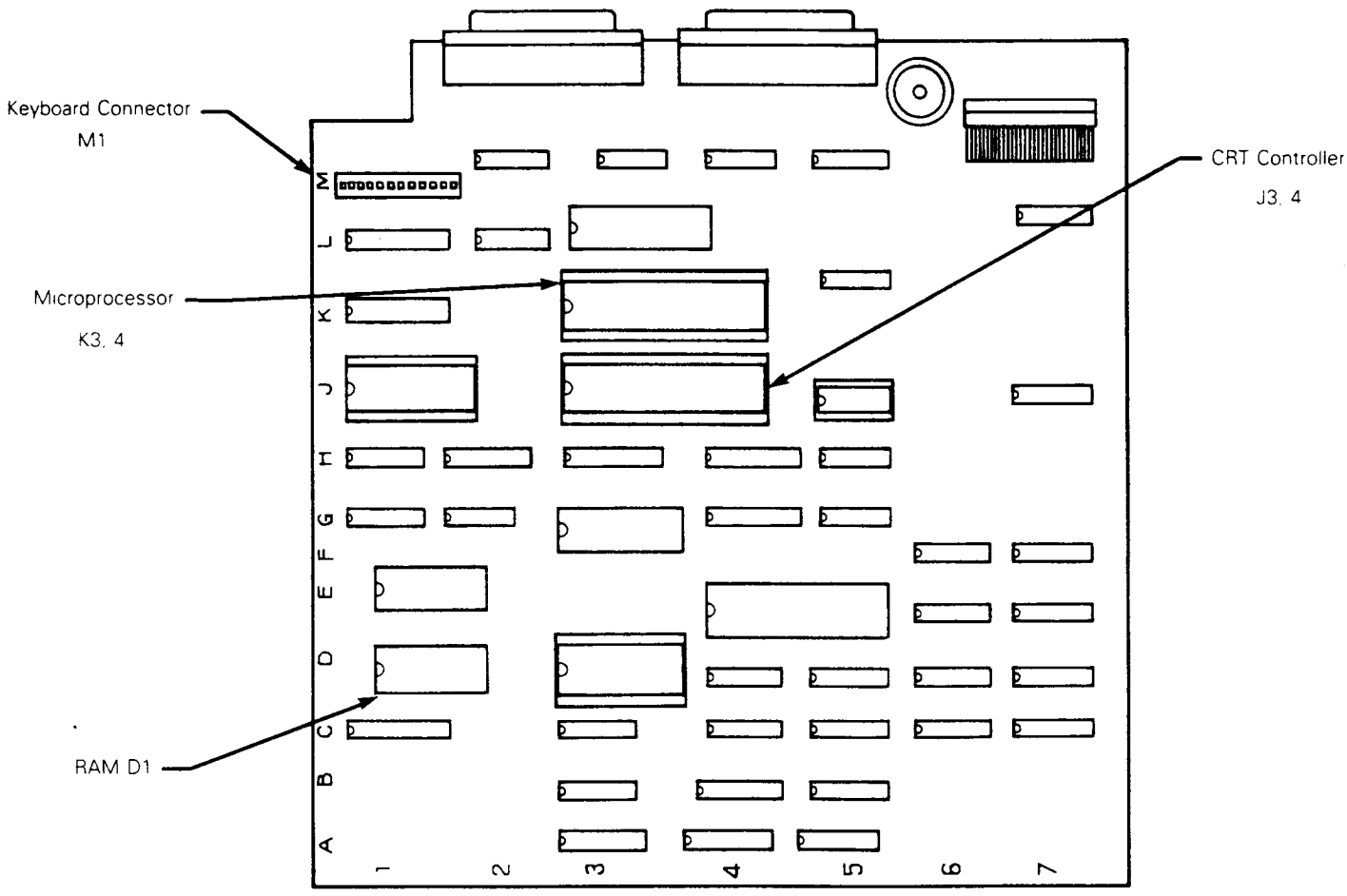
In the terminal characters are constructed within a 10 x 13 dot matrix (80 columns). The field must then be broken into vertical and horizontal axes: The vertical axes consist of scan lines and the horizontal axes consist of bit times. Thirteen scan lines and 10 bit times are used to define the character matrix (10 x 13) in an 80-column display. Thirteen scan lines and nine bit times are used to define the character matrix (9 x 13) in a 132-column display.

PRINTED CIRCUIT BOARD LAYOUT AND COMPONENT IDENTIFICATION

When you study the theory of operations for the terminal, you may want to identify certain components as you read about them. The text identifies each component with the X-Y coordinate system that you use on all printed circuit boards. This system can help you locate components on the PCB that are referred to in the schematics as well. Here is a brief explanation of the coordinate system:

A set of alphabetical coordinates (A, B, C, etc.) runs the length of the microprocessor board. A set of numerical coordinates(1, 2, 3, etc.) runs along the width of the microprocessor board. These coordinates form an X-Y grid. Each component's X-Y coordinate is printed next to it on the PCB. Look at Figure 6-1 for an example of coordinate identification.

Figure 6-1 Microprocessor PCB



MICROPROCESSOR PCB BLOCK DIAGRAM

Figure 6-2 is a block diagram of the microprocessor PCB. All of the logic (except the display and power supply) is located on the microprocessor PCB. Note that each block on the block diagram is numbered. This number corresponds to the item numbers given in the following descriptions.

Note--There are two versions of the microprocessor PCB in the field. One uses TTL logic throughout; the other replaces some TTL functions with a gate array integrated circuit. You will find notes in the text for any differences between the two configurations.

Single component microprocessor (1)--The terminal has a single-component microprocessor which contains 128 bytes of RAM, 32 I/O lines, two 16-bit counter/timers, and UART. It has integral interrupt and clock circuitry. The microprocessor IC uses eight data lines that are multiplexed with the lower eight address lines. Address information appears on these lines only when the ALE (address latch enable) signal is present. The upper address lines (A8-A15) are nonmultiplexed single-direction lines. The UART on the microprocessor PCB drives an RS-232C compatible printer.

CRT controller (2)--The programmable video timing controller IC is initialized by the microprocessor chip when you turn on the power. The CRT controller interfaces to the video display buffer (RAM) on a direct-memory access basis. Display data is then sent to the character generation circuitry for processing. The CRT controller chip generates the cursor and also provides the necessary timing and control information for the display logic (scan line count, horizontal synchronization, vertical synchronization, and blank).

UART (3)--The UART takes parallel data from the microprocessor and converts it to a bit-serial format for external communication equipment. In addition, the UART converts bit-serial information received from an external source, to parallel information usable by the microprocessor. The UART flags the microprocessor when it needs an interrupt.

Display RAM (4)--The display RAM consists of two 2K by 8-bit static RAM chips. RAM is used as a volatile storage medium for display information and telecommunications (TCOM) buffers. The RAM can be accessed by either the microprocessor or the CRT controller.

PROM (5)--The PROM is nonvolatile memory for program storage. Every routine resides in the PROM. The terminal PROM can be either 4K, 8K, or 16K bytes. The PROM does not reside within the normal memory map because it has a unique enable line (PSEN).

RAM address multiplexer (6)--The RAM address multiplexer allows address information from either the microprocessor or the CRT controller to access the RAM. The multiplexer is selected by the memory bus control (MBC) signal, which is generated by the CRT controller.

Address decoder (7)--The address decoder decodes the high order address bits (A13, A14, A15) and the Read and Write control lines

($\overline{RD}$ and $\overline{WR}$) from the microprocessor. From these signals the decoder generates enable signals for the RAM, UART, CRT controller, electrically alterable ROM (EAROM) keyboard, and diagnostic row buffer register.

Low order address latch (8)--This integrated circuit latches the lower order address information presented to it by the microprocessor at address latch enable time. This is necessary because the lower address lines also serve as the bidirectional data bus.

Bidirectional bus driver (9)--This driver gates data from the microprocessor to RAM, or data from RAM to the microprocessor.

Keyboard latch (10)--The microprocessor tests to see if a key has been pressed on the keyboard by addressing each key and then examining the keyboard return line (P1.4 on the CPU). The keyboard latch latches this address information so the keyboard can use it.

Row buffer RAM (11)--The row buffer RAM is loaded with display information from the display RAM. This display data is read out of the RAM 13 times (once for each scan line) and presented to the character generation circuit for decoding.

Low buffer latch (12)--The row buffer latch holds the display data from the video buffer (part of the display RAM) until it can be loaded into the row buffer RAM.

Row buffer diagnostic latch (13)--This latch is used for diagnostics only. It latches data during DMA transfers from the row buffer RAM to the row buffer data latch. At the end of each DMA transfer it retains the last byte transferred. This byte can be read by the CPU (prior to the next DMA transfer) and is useful in diagnosing failures in the data path between the video buffer and the character generation circuitry.

Memory bus control latch (14)--The memory bus control latch latches the CNTRL 3 signal from the CRT controller. This output is the memory bus control signal. This signal selects the RAM address multiplexer and enables the row buffer latch. It is used when the CRT controller reads in a row of characters with DMA.

Row address latches (15)--When the CRT controller initiates a DMA transfer, it outputs the address of the data in the video buffer it wishes to display. This address information (RA0-RA13) is latched into the row address latches for use by the RAM address multiplexer.

Row buffer data latch (16)--The row buffer data latch stores each character to be displayed (one at a time) for use by the attribute decoding and character generation circuitry.

Attribute decoding logic (17)--Each character read out of the row buffer RAM is examined to see if it is an attribute (blink, dim,

reverse video, etc). Attribute characters are distinguishable: bit 7 must be high, and bits 5 and 6 must be low. If an attribute code is detected, the display blanks at the attribute's location and all subsequent characters exhibit the enabled attribute.

Attribute latches (18)--The attribute latches comprise a current attribute and a row attribute latch. These latches ensure that each character displayed has the correct attribute and that each scan line within a row starts with the correct attribute.

Character generator (19)--The character generator is a PROM that has been programmed to provide a unique bit pattern output for each displayable character.

Character generator address latch (20)--The CRT controller outputs are multiplexed. One of the outputs is scan line information. This scan line information is presented to the address latch, where it will (in conjunction with data from the row buffer RAM) serve as address information to the character generator.

Level converters (EIA to TTL) (28 and 33)--These level converters change the EIA RS-232C logic levels to TTL levels for use by the UARTs.

Level converters (TTL TO EIA) (29 and 32)--These level converters change the TTL logic levels from the UARTs to RS-232C levels for use with external equipment.

TCOM clock generator (30)--The telecommunications (TCOM) clock generator circuit consists of a crystal oscillator that provides the basic clock for the UART. The UART is then programmed (by the user in the setup) for the appropriate baud rate.

Pass-thru multiplexer (31)--The pass-thru multiplexer can be enabled so that data received by the main UART can be passed through to the output of the secondary UART (inside the microprocessor). This allows received data to be sent directly to a printer without CPU intervention.

(32)--See item 29

(33)--See item 28

CPU clock generator (34)--The CPU clock generator consists of a 11.000 MHz crystal connected to the XTAL input to the CPU. The CPU has its own internal clock generation circuitry that divides the basic crystal frequency into frequencies usable by the CPU.

CRT AND POWER SUPPLY BLOCK DIAGRAM

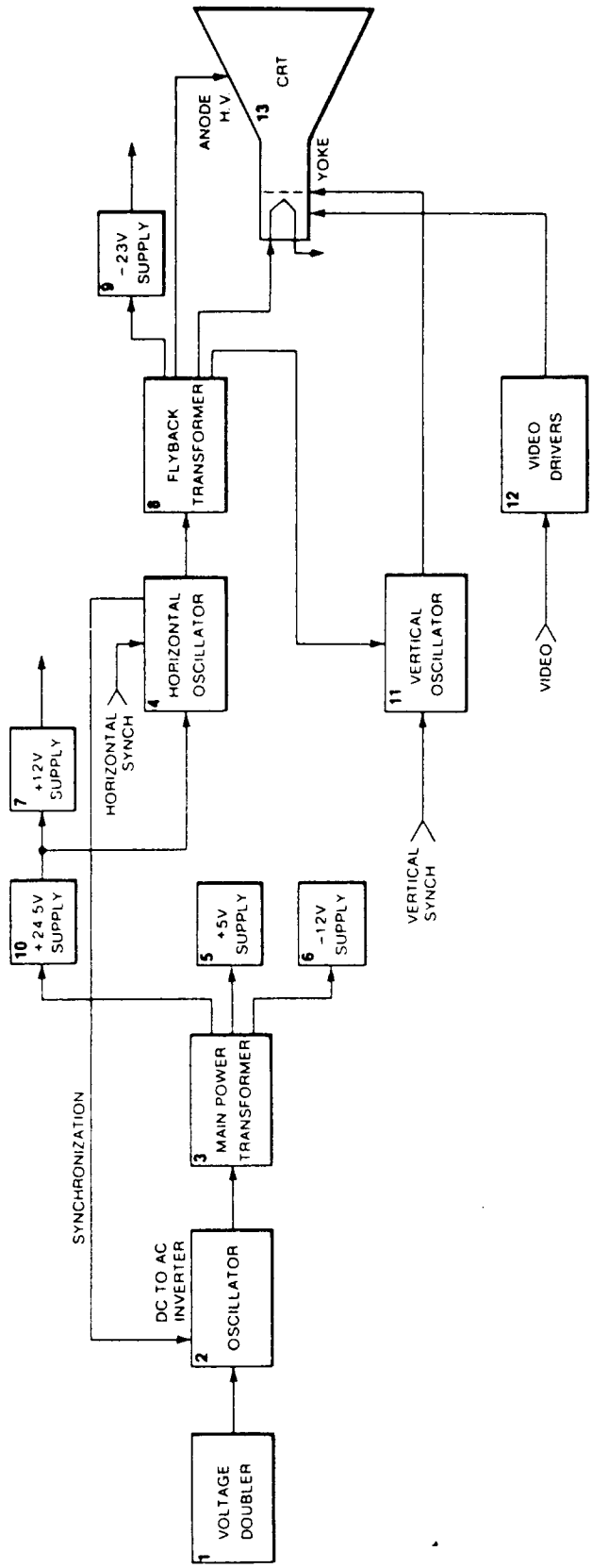
The terminal contains a combination monitor/power supply assembly. The power supply provides the voltages for all the logic. These voltages are +12V, -12V, +5V, -23V, and +24.5V. The -23V is used exclusively by the EAROM. Only the monitor/power supply uses the +24.5V supply. Figure 6-3 is a block diagram of the combination monitor/power supply. Note that each block is numbered. This number corresponds with the item number in the following descriptions.

Voltage doubler (1)--The terminal operates with either a 115 VAC or 230 VAC input. The voltage doubler circuit provides 350 VDC to the oscillator circuit when 115 VAC is applied, and is passive when the 230 VAC input strap is installed. This assures that the oscillator (DC to AC converter) always has a 350 VDC input regardless of the AC input voltage.

DC to AC converter (2)--The converter consists of a pair of switching transistors. It sends AC input voltage to the main power transformer. The DC to AC inverter is synchronized with the horizontal oscillator to eliminate beat frequencies.

Main switching power transformer (3)--The main power transformer provides taps for the power supply regulator circuitry and the horizontal oscillator.

Figure 6-3 Monitor/Power Supply Block Diagram



Horizontal oscillator (4)--The horizontal oscillator provides the signal to drive the flyback transformer at the correct frequency. It also makes sure that the yoke is driven at the correct frequency so that the electron beam sweeps from left to right at the correct rate. Refer to Figure 6-4 for the horizontal oscillator timing information.

+5 volt supply (5)--The +5V is derived directly from one of the main transformer taps which provides low voltage AC. The output of this tap is rectified and regulated. Regulation is accomplished by optically coupling a signal back to the DC to AC inverter which controls its duty cycle, and hence the output voltage of the main switching power transformer.

-12 volt supply (6)--The -12V supply is derived from one of the main transformer taps. The low voltage AC output is rectified and regulated.

+12 volt supply (7)--The +12V supply is derived from the +24.5 VDC. It uses a linear regulator.

Flyback transformer (8)--The flyback transformer steps up the output of the horizontal oscillator to provide the high voltage for the CRT itself. In addition, the flyback transformer has taps that provide filament power and low voltage AC input to the -23V supply.

-23 volt supply (9)--The -23V supply receives its low voltage AC input from the flyback transformer. This voltage is then rectified and filtered to provide the -23V for the EAROM.

+24.5 volt supply (10)--The +24.5V supply is derived from one of the main transformer taps. The low voltage AC output is rectified and then regulated by a linear regulator.

Vertical oscillator (11)--The vertical oscillator provides the yoke with the correct vertical drive frequency to ensure that the electron beam scans the face of the CRT at the correct vertical repetition rate. Refer to Figure 6-5 for vertical timing information.

Video drivers (12)--The video drivers provide the video input to the CRT with the correct voltage to bias the CRT grid.

CRT (13)--The cathode ray tube (CRT) displays data by modulating the electron beam with the video signal while the beam moves across the face of the screen. The horizontal and vertical drive signals determine the rate of movement.

Figure 6-4 Horizontal Oscillator Timing

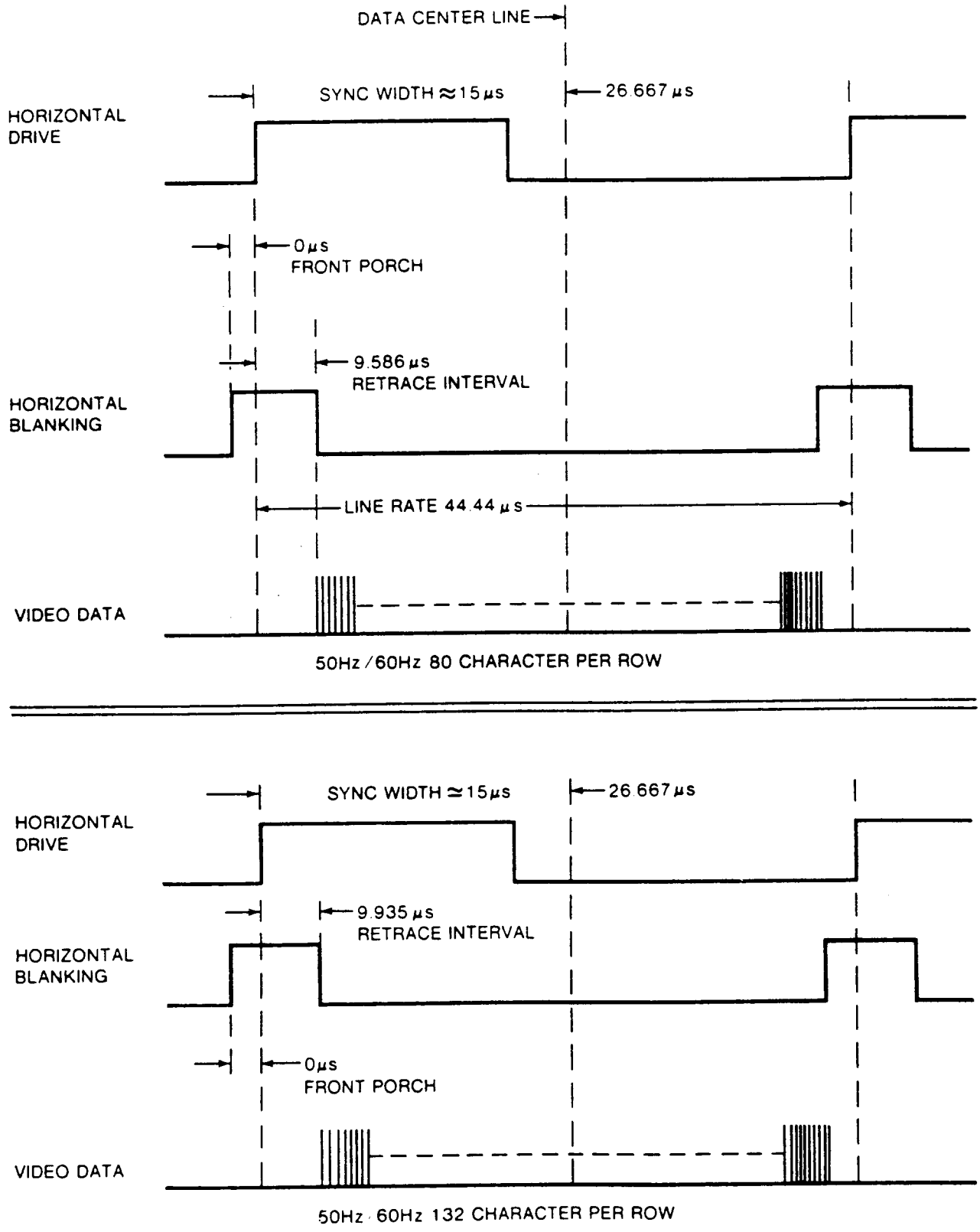
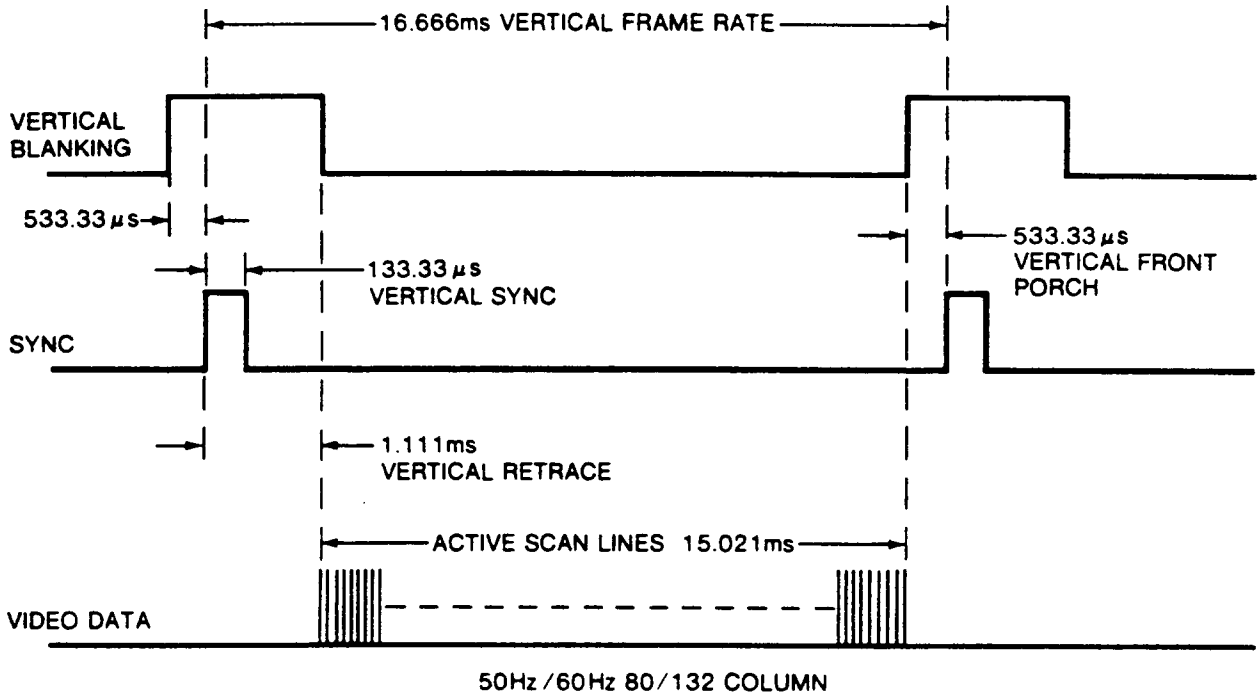


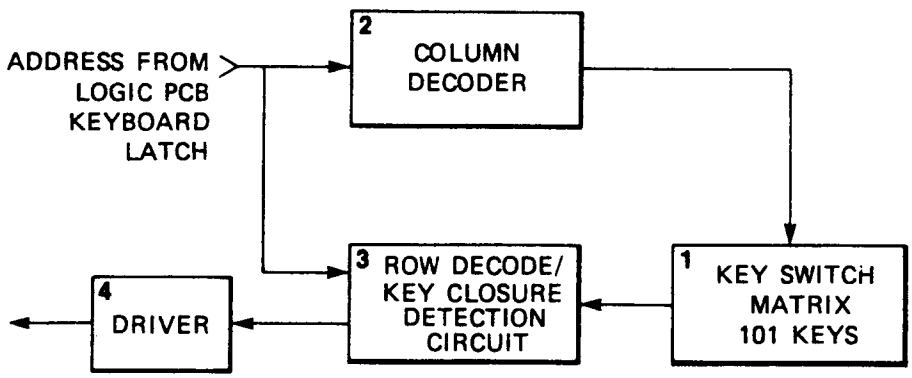
Figure 6-5 Vertical Timing



KEYBOARD BLOCK DIAGRAM

Figure 6-6 is a block diagram of the terminal keyboard. The logic that interfaces with the keyboard resides on the microprocessor PCB. Note that each block on the diagram is numbered. This number corresponds to the item numbers given in the following descriptions.

Figure 6-6 Keyboard Block Diagram


ADDRESS FROM LOGIC PCB KEYBOARD LATCH
2 COLUMN DECODER
3 ROW DECODE/ KEY CLOSURE DETECTION CIRCUIT
1 KEY SWITCH MATRIX 101 KEYS
4 DRIVER

Key switch matrix (1)--The key switch matrix is divided into 16 columns and 8 rows. Each row is pulled up to +5V with a pull-up resistor. A key switch is located at each intersection of a row and a column. Pressing a KEY switch results in a unique column and row juncture.

Column decoder (2)--The column decoder is driven by the keyboard address latch on the microprocessor PCB. The microprocessor selects each column. When the microprocessor selects a column, the column decoder drives the selected column line low. Because the row lines are all pulled high, a key closure results in the column line pulling the row line low (logic 0).

Row decoder/key closure detection circuit (3)--The microprocessor addresses the row decoder, which in turn examines each row in the keyboard switch matrix. If a key has been pressed, the row decoder encounters a logic low on its input line (because the column line pulled the row line low). When this occurs, the key closure detection circuit informs the CPU of a key closure.

Line drivers (4)--The keyboard line drivers provide adequate output to minimize the signal decrease between the keyboard and the microprocessor PCB.

FUNCTIONAL DESCRIPTION

The logic board consists of six sections: microprocessor, communications interface, display memory, nonvolatile memory, keyboard interface, and video control.

Microprocessor

The 8031 microprocessor contains 128 bytes of RAM, two counter/timers, a full duplex serial port, and two parallel ports. The processor operates at 11 MHz. This allows most instructions to execute in 1.1 microseconds.

The 8031 has separate addresses for program storage and I/O. Program storage is selected with signal PSEN. The terminal uses 8K of program storage but can be expanded to 16K with no jumpers or to 32K with one jumper. The I/O address space is selected by $\overline{RD}$ (read) or $\overline{WR}$ (write).

There is an 8-bit data bus, which has the eight lower order address bits multiplexed during bus cycles. The lower address bits are latched into an 8-bit latch by the ALE signal (address latch enable). The upper eight address bits have a dedicated output port on the 8031.

Table 6-1 is a list of 8031 pin assignments.

Table 6-1 8031 Pin Assignments

Pin	Assignment
P0.0-P0.7	Data bus and lower byte of address bus.
P1.0	$\overline{\text{AUX READY}}$. Input from auxiliary serial port. Indicates DTR line is asserted.
P1.1	NVDOUT. Input from nonvolatile memory. Data is shifted in serially from memory.
P1.2	Pass-thru. Output from 8031 sends data received from the MODEM port out through the AUX port.
P1.3	$\overline{\text{AUX RTS}}$. Input to 8031 from AUX port. Indicates RTS is being asserted by AUX device.
P1.4	Key return. Input from the keyboard to the CPU. Signal is high if currently addressed key is pressed.
P1.5	BELL. Output by 8031 to sound tone generator.
P1.6	$\overline{\text{DIM/REV}}$. Output by 8031 to define presentation of protected characters on CRT. Low is dim. High is reverse video.
P1.7	$\overline{80}$/132. Output by 8031. Selects 80-column or 132-column display.
P2.0-P2.7	Address bits 8-15 output by 8031 during bus cycles.
P3.0	RXD. Received data from AUX serial port.
P3.1	TXD. Transmitted data from 8031 to AUX port.
P3.2	$\overline{\text{INT0}}$. ($\overline{\text{BRE}\emptyset}$). Interrupt input from CRT controller during DMA transfers.
P3.3	$\overline{\text{INT1}}$. ($\overline{\text{SI}\emptyset\text{IR}}$). Interrupt input from MODEM port UART. Indicates data in the receive buffer.
P3.4	T$\emptyset$. ($\overline{\text{VTIR}}$). Timer 0 input. Generates interrupts by CRT controller.
P3.5	T1. ($\overline{\text{GRAPHICS}}$). Output by 8031 to turn on graphics interface signals.

P3.6	$\overline{WR}$. I/O Write signal output by 8031.
P3.7	$\overline{RD}$. I/O Read signal output by 8031.
RST	Reset. High input resets 8031.
EA	$\overline{\text{External access}}$. Low signal forces 8031 to make program fetches from external ROM.
ALE	Address latch enable. Latches multiplexed lower order address bits from data bus into address latch.
PSEN	$\overline{\text{Program store enable}}$. Enables external ROM during program fetch.

Communications Interface

Both independent serial ports [the MODEM port and the AUX (auxiliary) port] are asynchronous. The MODEM port connects to a terminal or a modem. The AUX port usually connects to a printer.

The MODEM port is implemented with a 2661-B UART. The UART derives its baud rate clock from a 4.9152 MHz crystal. The 1488 and 1489 buffers provide the voltage level conversion for interfacing RS-232 lines. Noise filtering is provided by the 220 pF capacitors.

The AUX port uses the UART in the 8031. The 11 MHz processor clock is divided internally by timer one to provide baud rates.

In addition to operating independently of the MODEM port, the AUX port may operate in a pass-thru mode. In the pass-thru mode, the data received by the MODEM port is retransmitted from the AUX port. The DTR signal received by the AUX port is passed through to the MODEM port.

Display Memory

The display memory in the terminal is dual-ported between the CRT controller and the 8031 processor. Normally, there are two 2K RAM chips installed for single-page operation.

The PCB can be expanded by one or two 8K x 8 byte RAMs, but this expansion is not supported by the firmware.

During the first scan line of each character row, the 2672 CRT controller sends an interrupt to INT0 of the 8031 nine microseconds before starting a DMA transfer from the display RAM. The 8031 may not access the display RAM while this signal is asserted. The 8031 does not stop during the DMA transfer and may service any other devices at this time.

Nonvolatile Memory

The terminal stores configuration parameters in the 100 x 14-bit nonvolatile memory. The memory operates from +12V and -23V. To generate these voltages, the monitor power/supply should receive a horizontal frequency signal 250 milliseconds before trying to read from or write to the nonvolatile RAM.

The EAROM requires a command code on the C1, C2, and C3 inputs in order to erase, read, or write. Address and data information are clocked into the EAROM through the bidirectional D pin.

The 8031 controls the EAROM through a control latch (4H on the TTL PCB, 5G on the gate array PCB). The control latch signal levels are translated by 7406 open collector inverters to the 12 volt levels required by the ER1400 EAROM. Data read out of EAROM is translated to TTL levels by a comparator before being read by the 8031 on P1.1.

Keyboard Interface

Each key on the keyboard is tested for key depression by presenting its address to a latch, then testing the line at P1.4 on the 8031. At least 6 microseconds elapse between outputting an address and testing the key return.

Debouncing and multiple key depressions are handled by the 8031.

Video Controller

The video controller consists of the dot and character clock section, the 2672 programmable video timer controller, attribute control, character font, and video shift register.

Video Clock Circuitry

A 68.85 MHz oscillator provides the basic timing for the dot clock and character clock. A 68.85 MHz crystal provides the positive feedback around a 74F04 inverter (2B,TTL; 3B, gate array). The crystal is used in a series resonant overtone mode. A T-network consisting of resistors (R3 and R44, TTL; R2 and R3, gate array) and a capacitor (C9, TTL; C11, gate array) provide DC feedback around the inverter for proper biasing while blocking AC. An inductor and capacitor (L1 and C72, TTL; L1 and C14, gate array) form a parallel resonant circuit to reduce the oscillator's feedback if it attempts to oscillate at the wrong overtone frequency. Another capacitor (C8 on both boards) provides an AC path to ground for the resonant circuit.

The output from the oscillator is buffered by another 74F04 and then applied to a divider (2A, TTL; 3A, gate array). The divider circuit divides by 2 for 132-column operation or by 3 for 80-

column operation. The dot clock from the divider goes to the video shift register and the character clock generator.

The character clock generator consists of a Johnson counter (3B, 4B, and 3A, TTL; 4A, 4B, and 5A, gate array) which divides the dot clock by 10 in 80-column mode and by 9 in 132-column mode. The character clock generator also provides a properly phased load enable signal for the video shift register.

Programmable Video Controller

The 2672 programmable video timing controller (PVTC) provides all the timing and control signals for displaying characters on the CRT (3J). The 8031 initializes the 2672 with the display parameters when a user turns the terminal ON. Before each displayable character row, the 8031 gives the 2672 the beginning character address for that row. The 2672 fetches characters from the display RAM during the first scan line of each displayable character row. During the following 12 scan lines the characters are retrieved from the row buffer.

The 2672 warns the 8031 of an impending DMA transfer by asserting BREQ 9 microseconds before the DMA transfer begins. After 9 microseconds, the 2672 asserts memory bus control (MBC) which ports the display RAM into the row buffer RAM and disconnects the display RAM from the 8031 bus. Since the DMA transfers do not stop the 8031, there is an additional 1.17 milliseconds of program execution time available during each video frame (26 row x 45 microseconds horizontal period).

In addition to providing the character addressing, the 2672 also generates the scan line count and attribute control signals. The scan line count, blink rate, and underscore signals are multiplexed on the 2672's character address lines. At the beginning of each scan line these multiplexed signals are clocked by the falling edge of the blank signal into a latch (4D).

Attribute Control

Attribute control determines the way the CRT displays characters. There are five attributes: blink, blank, underscore, reverse, and dim. Reverse and dim are hidden, the attribute is not embedded in the display data and doesn't occupy a character location. The rest of the attributes are "not hidden." Not hidden means that the attribute is embedded in the display data and occupies a character location on the screen.

As data is presented to the character generator (3D, TTL; inside the gate array), it is simultaneously decoded by the attribute controller to determine if it is display data or an attribute. If bit 7 is high and bits 6 and 5 are low, then the data byte is interpreted as an attribute byte.

APPENDIX A SPECIFICATIONS

PHYSICAL

Dimensions	Video Module: 12"H x 12.3"W x 13"D (30.48cm x 31.24cm x 33.02cm) Video Module Base: 1.25"H x 12.25"W x 10.25"D (3.20cm x 31.12cm x 26.04cm) Keyboard: 2.25"H x 17.25"W x 7.6"D (5.72cm x 43.82cm x 19.3cm)
Net Weight	30 lbs. (13.5kg approx.)
Finish	Two-tone gray

CRT

Size	14" diagonal (35.56cm)
Display	Nonglare, P138 green phosphor Nonglare, P134 orange phosphor Swivel: 270 degrees Tilt: 15 degrees
Screen Format	80 or 132 columns (user selectable) 26 rows (tworows for terminal status and function key identification)
Character Matrix	80 column: 7 x 13 matrix, 10 x 13 cell 132 column: 7 x 13 matrix, 9 x 13 cell
Character Set	128 characters (96 displayable ASCII characters, 16 control code symbols, and 16 graphics characters)
Language Keyboard Codes	U.S. (American), U.K. (British), French, German, Spanish, Danish

Video Attributes	Normal, dim, blink, blank, underline, and reverse
Horizontal Frequency	22.9 KHz
Video Bandwidth	17.0 MHz
Total Active Scan Lines	338
Total Scan Lines	375
Total Pixel Resolution	800 by 338
Cursor	Block or line Blinking or nonblinking (user selectable)
Memory	One page

KEYBOARD

Type	Low-profile detached, with 6-foot coiled cable (1.83m) Two-position tilt (low postition meets DIN specification)
Keys	101, including 16 programmable function keys (shiftable to 32), and numeric keypad. N-key rollover with ghost key lockout

COMMUNICATIONS

Ports	Two independent EIA RS-232C interfaces
Mode	Asynchronous TTY compatible (block and conversational)
Baud Rates	MODEM: 50, 75, 110, 134.5, 150, 300 600, 1200, 1800, 2000, 2400, 4800, 9600, 19.2K, 38.4K bps AUX: 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19.2K bps

Here are the attribute bit assignments:

Bit	Value		
7	1	*	Indicates byte is an attribute.
6	0	*	
5	0	*	
4	A	Reverse Video	1-ON 0-OFF
3	B	Underscore	1-ON 0-OFF
2	C	Blank	1-ON 0-OFF
1	D	Blink	1-ON 0-OFF
0	E	Dim	1-ON 0-OFF

If a data byte is an attribute, it is routed through multiplexed 5D, 5A, 6A, and 7A into the current attribute latch 6C on the TTL PCB. The data byte is routed through the gate array on the gate array PCB. A new attribute always replaces the previous one and affects all the following displayed data until the next attribute is encountered. Whenever a new attribute is latched, the shift register (2C, 3C, and 4C, TTL; 3C, 4C, and 5C, gate array) is inhibited from loading the contents of the character font (3D); therefore, the screen location of an attribute is always blank (video off).

The outputs of the current attribute latch (6C, TTL; within the gate array) are decoded to create the different attributes. Blank and blink are created by inhibiting the shift register from loading. Underscore is exclusive OR'd with the reverse and cursor functions, and the shift register load is inhibited.

The reverse video functions (cursor, underscore, reverse, character) are exclusive OR'd with the serial video bit stream.

At the beginning of the first scan line of each character row, the attribute latch (6D, TTL; within the gate array) is loaded from the attribute latch (6C, TTL; within the gate array). This allows the last active attribute of each character row to propagate to subsequent character rows until a new attribute is encountered. Memory bus control (MBC) from the 2672 PVTC causes this transfer. At the beginning of every scan line (including the first scan line), the current attribute latch (6C, TTL; within the gate array) is loaded from the row attribute latch (6D, TTL; within the gate array). This action restores the current attribute latch to the initial value for this character row.

The attribute controller also detects protected characters and displays them as dim, reverse, or normal. A protected character is detected when D7 is 1 and either D6 or D5 (or both) is also 1.

Character Generator

Each character cell is 10 dots (80-column) or 9 dots (132-column) wide by 13 scan lines high.

A 200ns 2732A EPROM stores the font. Address bits (A0 through A3) select the appropriate pattern for the current scan line. Address bits (A4 through A10) select the 128 ASCII and line drawing characters when A11 is low. A11 controls the lower or upper 128 characters select. Both lower and upper shift have the same characters. The firmware can select A11 for the protect attribute. This makes normal video one of the protect options.

Row Buffer Diagnostic Register

The row buffer diagnostic register (4E, TTL; 4H, gate array) latches data during DMA transfers. At the end of a DMA transfer, this register contains the last byte of the transfer. The CPU can read this byte before the next transfer.

Video Shift Register

The video shift register (2C, 3C, and 4C, TTL; 3C, 4C, and 5C, gate array) provides the serial bit stream to the video input of the monitor/power supply PCB. The shift register is controlled by the attribute control section by a single signal. The shift register can parallel load from the character font or it can shift right. Whenever the register shifts data out to the right, it also shifts in zeros from the left. In this way the shift register is automatically cleared to all zeros at the end of each character boundary. To create a blank character cell on the CRT, it is only necessary to inhibit the register from loading during that character cell boundary.

The output from the shift register goes to a dot stretcher composed of NPN transistor Q2 (Q3, gate array) and capacitor C30 (C61, gate array). The dot stretcher extends the on-time of the video dots so that vertical columns of single dots appear in equal intensity to the horizontal strings of dots.

After the dot stretcher, the video goes to an exclusive OR gate (7D, TTL; 6E, gate array) that creates reverse video for the cursor and reverse attributes. The video is next OR'd with any external video input (5E, TTL; 7E, gate array). Finally, the video is gated with the blanking signal (7G, TTL; 6C, gate array) from the CRT controller.

Bit Length	7 or 8 bits (user selectable)
Stop Bits	1 or 2 (user selectable)
Parity	Odd, even, mark, or none (user selectable)
Handshake Protocols	
MODEM port	XON/XOFF, DTR, both, or none
AUX port	DTR only

COMPATIBILITY

Native Mode	Wyse WY-100, Lear Siegler ADM-31
Compatible Mode	TeleVideo 910, 920, 925 ADDS Viewpoint Hazeltine 1500

POWER

Fuse	2a, 250V	
Standard	90 to 130 VAC 50/60 Hz ± 5%	
Optional	200 to 240 VAC 50/60 Hz ± 5%	
Power	45 watts	
Power Available	With Logic	Without Logic
+5V	500 ma	2000 ma
+12V	100 ma	200 ma
-12V	100 ma	200 ma
-23V	20 ma	40 ma

LOGIC

CPU	8031, 11 MHz
PUTC	2762
UART	2661

ENVIRONMENT

Temperature	Operating: 32 to 113 degrees F (10 to 40 degrees C) Storage: -40 to +140 degrees F (-40 to +60 degrees C)
Humidity	10% to 90% relative, noncondensing
Altitude	Sea level to 15,000 feet (0 to 4,572m)

APPENDIX B CONNECTOR PIN ASSIGNMENTS

The MODEM and AUX (auxiliary) port connector pin assignments are listed below.

MODEM RS-232C (DTE)

Pin No.	Signal
1	Shield Ground
2	Transmit Data (output)
3	Receive Data (input)
4	Request to Send (output)
* 5	Clear to Send (input)
6	Not Used
7	Signal Ground
* 8	Data Carrier Detect (input)
** 9	
10	Not Used
11	Not Used
12	Not Used
**14	
**18	
19	
20	Data Terminal Ready (output)
**24	
**25	

* Don't connect these pins. If they receive low signals, the terminal will not operate.

AUX RS-232C (DCE)

Pin No.	Signal
1	Shield Ground
2	Transmit Data (input, not used)
3	Receive Data (output)
4	Request to Send (input, not used)
5	Clear to Send (output, not used)
6	Data Set Ready (output)
7	Signal Ground
8	Data Carrier Detect (output, not used)
***20	Data Terminal Ready (input)

** Leave these pins unconnected, they carry graphics input for the WY-1000.

*** For handshaking purposes. Busy/Ready Protocol:

Busy: -3 to -12 V
Ready: +3 to +12 V

APPENDIX C SCHEMATICS

This appendix contains schematic diagrams for the logic and monitor/power supply PCB. Use them to help you troubleshoot the terminal.

Schematic	Location
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Logic Board, WY-50 Gate Array Version 96-018-01 Rev. F, 2 of 2	C-27

Logic Board, WY-50
Gate Array II Version
96-058-01, 1 of 2 C-29

Logic Board, WY-50
Gate Array II Version
96-058-01, 2 of 2 C-31

Monitor/Power Supply, WY-50
96-019-01 Rev. E, 1 of 1 C-33

Monitor/Power Supply, WY-50
96-019-01 Rev. F, 1 of 1 C-35

Logic Board, WY-50+
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Logic Board, WY-50+
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Monitor/Power Supply, WY-50+
96-019-02, 1 of 1 C-41

WY-50+ ADDENDUM

TO THE WY-50 DISPLAY TERMINAL

MAINTENANCE MANUAL

Document 880155-01 Rev. A

January 1986

Wyse Technology
3571 North First Street
San Jose, CA 95134

To: Wyse Servicers

From: Wyse Customer Service

Date: January 1986

Subject: WY-50 Maintenance Manual Addendum Instructions

Now that the WY-50+ is available, you'll need to service both the WY-50 and the WY-50+ terminals. This addendum package enables you to convert your existing WY-50 Maintenance Manual to a WY-50/WY-50+ Maintenance Manual. Replace the outdated pages listed below with the enclosed revised pages and add the WY-50+ appendix (Appendix D), which explains in detail all servicing differences. We have also enclosed several new schematics. These include revisions of two schematics already in your WY-50 manual, as well as the following: the WY-50+ Logic Board, the WY-50+ Monitor/Power Supply Board, and a third version of the WY-50 Logic Board.

Old Pages	New Pages	Action
Title page through vii	New Title page through vii	Replace
A-1 to A-3	A-1 to A-4	Replace
C-1	C-1 and C-2	Replace
	C-25 to C-31 C-35 to C-41	Add according to page location list on new C-1 and C-2.
	Appendix D	Add, directly after the last schematic and before the Index.
Index	Index	Replace

WY-50/WY-50+ DISPLAY TERMINAL

MAINTENANCE MANUAL

Document 880020-01 Rev. B

January 1986

Wyse Technology
3571 North First Street
San Jose, CA 95134

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FCC Warning

This equipment generates, uses, and can radiate radio frequency energy, and if not installed and used in accordance with the instruction manual, may cause interference to radio communications. It has been tested and found to comply with the limits for a Class A computing device pursuant to Subpart J of Part 15 of FCC Rules, which are designed to provide reasonable protection against such interference when operated in a commercial environment. Operation of this equipment in a residential area is likely to cause interference, in which case the user, at his own expense, will be required to take whatever measures may be required to correct the interference.

PREFACE

This maintenance manual contains information on how to service and repair the WY-50 and WY-50+ terminals. Appendix D describes additional diagnostic firmware specific to the WY-50+ terminal, an enhanced version of the WY-50. We assume you are a qualified service technnician with previous experience in terminal and computer repair. To take full advantage of this manual, we suggest you read the information in the order presented.

HOW TO USE THIS MANUAL

This manual is divided into six chapters and four appendixes. Chapter one provides important information for the technician who has never serviced this terminal before. If you are already familiar with the terminal, the technical information in Appendix A can serve as an ongoing introduction. Here is a summary of this manual:

Chapter 1, "Product Overview" describes the terminal, including internal functions, I/O, telecommunications, environmental needs, and operator controls.

Chapter 2, "Removal and Replacement Procedures," shows you how to take the terminal apart and put it back together again. It includes instructions on how to change power requirements on the terminal from domestic to international.

Chapter 3, "Troubleshooting," tells you what to look for and how to fix problems on the terminal. It includes a list of tools needed for troubleshooting, a quick reference guide, and a flowchart.

Chapter 4, "Adjustments and Alignments," describes power supply and monitor adjustments that control the quality of the display.

Chapter 5, "Illustrated Parts List," includes a list of display and keyboard assembly parts.

Chapter 6, "Theory of Operation," describes the terminal operation by function.

Appendix A, "Specifications," lists the terminal's specifications.

Appendix B, "Connector Pin Assignments," lists the signals on each pin of the MODEM and the AUX ports located on the rear panel of the terminal.

Appendix C, "Schematics," includes schematics for the microprocessor PCB, keyboard, and monitor/power supply PCB.

Appendix D, "Servicing the WY-50+," describes new diagnostic firmware included in the WY-50+, the enhanced version of the WY-50, and lists new part numbers.

REFERENCE MANUALS

These publications provide additional information about the terminal.

WY-50 Display Terminal Reference Manual, Wyse 88-011-01

WY-50 Display Terminal Quick Reference Guide, Wyse 88-021-01

WY-50+ User's Guide, Wyse 880153-01

WY-50+ Programmer's Guide, Wyse 880154-01

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APPENDIX A SPECIFICATIONS

PHYSICAL

Dimensions	Video Module: 12"H x 12.3"W x 13"D (30.48cm x 31.24cm x 33.02cm) Video Module Base: 1.25"H x 12.25"W x 10.25"D (3.20cm x 31.12cm x 26.04cm) Keyboard: 2.25"H x 17.25"W x 7.6"D (5.72cm x 43.82cm x 19.3cm)
Net Weight	30 lbs. (13.5kg approx.)
Finish	Two-tone gray

CRT

Size	14" diagonal (35.56cm)
Display	Nonglare, P138 green phosphor Nonglare, P134 orange phosphor Swivel: 270 degrees Tilt: 15 degrees
Screen Format	80 or 132 columns (user selectable) 26 rows (tworows for terminal status and function key identification)
Character Matrix	80 column: 7 x 13 matrix, 10 x 13 cell 132 column: 7 x 13 matrix, 9 x 13 cell
Character Set	128 characters (96 displayable ASCII characters, 16 control code symbols, and 16 graphics characters)
Language Keyboard Codes	U.S. (American), U.K. (British), French, German, Spanish, Danish

Video Attributes	Normal, dim, blink, blank, underline, and reverse
Horizontal Frequency	22.9 KHz
Video Bandwidth	17.0 MHz
Total Active Scan Lines	338
Total Scan Lines	375
Total Pixel Resolution	800 by 338
Cursor	Block or line Blinking or nonblinking (user selectable)
Memory	One page

KEYBOARD

Type	Low-profile detached, with 6-foot coiled cable (1.83m) Two-position tilt (low postition meets DIN specification)
Keys	101, including 16 programmable function keys (shiftable to 32), and numeric keypad. N-key rollover with ghost key lockout

COMMUNICATIONS

Ports	Two independent EIA RS-232C interfaces
Mode	Asynchronous TTY compatible (block and conversational)
Baud Rates	MODEM: 50, 75, 110, 134.5, 150, 300 600, 1200, 1800, 2000, 2400, 4800, 9600, 19.2K, 38.4K bps AUX: 110, 134.5, 150, 300, 600, 1200, 1800, 2000, 2400, 3600, 4800, 7200, 9600, 19.2K bps

Bit Length	7 or 8 bits (user selectable)
Stop Bits	1 or 2 (user selectable)
Parity	Odd, even, mark, or none (user selectable)
Handshake Protocols	
MODEM port	XON/XOFF, DTR, both, or none
AUX port	DTR only

COMPATIBILITY

Native Mode	Wyse WY-100, Lear Siegler ADM-31
Compatible Mode	TeleVideo 910, 920, 925 ADDS Viewpoint Hazeltine 1500

POWER

Fuse	2a, 250V
Standard	90 to 130 VAC 50/60 Hz ± 5%
Optional	200 to 240 VAC 50/60 Hz ± 5%
Power	45 watts

Power Available	With Logic	Without Logic
+5V	500 ma	2000 ma
+12V	100 ma	200 ma
-12V	100 ma	200 ma
-23V	20 ma	40 ma

LOGIC

CPU	8031, 11 MHz
PUTC	2762
UART	2661

ENVIRONMENT

Temperature	Operating: 32 to 113 degrees F (10 to 40 degrees C) Storage: -40 to +140 degrees F (-40 to +60 degrees C)
Humidity	10% to 90% relative, noncondensing
Altitude	Sea level to 15,000 feet (0 to 4,572m)

APPENDIX C SCHEMATICS

This appendix contains schematic diagrams for the logic and monitor/power supply PCB. Use them to help you troubleshoot the terminal.

Schematic	Location
Keyboard, WY-50 96-013-01, 1 of 1	C-3
Logic Board, WY-50 96-012-01, 0 of 7	C-5
Logic Board, WY-50 96-012-01, 1 of 7	C-7
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Logic Board, WY-50
Gate Array II Version
96-058-01, 1 of 2 C-29

Logic Board, WY-50
Gate Array II Version
96-058-01, 2 of 2 C-31

Monitor/Power Supply, WY-50
96-019-01 Rev. E, 1 of 1 C-33

Monitor/Power Supply, WY-50
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Logic Board, WY-50+
96-058-05, 1 of 2 C-37

Logic Board, WY-50+
96-058-05, 2 of 2 C-39

Monitor/Power Supply, WY-50+
96-019-02, 1 of 1 C-41

APPENDIX D SERVICING THE WY-50+

INTRODUCTION TO WY-50+ MAINTENANCE

Servicing the WY-50+ is nearly the same as servicing the WY-50. Major feature differences include the amber screen, additional compatible modes, a bi-directional AUX port, Wyseword standard, and multiple pages of memory (two standard, four optional). New servicing features include an expanded set of field diagnostics, a keyboard function test, a test to check all character sets, and two new built-in test patterns for display alignment.

TROUBLESHOOTING

Added troubleshooting features include an improved self-test, a new diagnostic self-test, a communication port test, a keyboard function test, an attribute/character font test, and a new display to check all attributes.

Note--Running the diagnostic tests described here (other than the power-on self-test) defaults all setup parameters and function keys.

Power-On Self-Test

When a user turns the terminal on, it performs a self-test of the logic PCB. If the self-test discovers a failure, an alphanumeric error code indicating failure type will appear in the lower-right corner of the display. An error code usually indicates logic PCB replacement. Table D-1 lists and explains the error codes.

Table D-1 Power-On Self-Test Error Codes

Error Message	Error Type
0	RAM bank 0
1	RAM bank 1
K	Reinitialize EAROM (Press the SETUP key to continue or turn off the terminal, then on again. Replace logic PCB only if error appears repeatedly.)
P	Code ROM checksum
Z	Processor RAM

The self-test checks RAM, EAROM, and the CPU. The RAM test is a read/write test that checks all 8K of RAM, or all 16K if additional memory is installed on the logic PCB. The CPU test checks 128 bytes of RAM in the CPU, the data lines, and the address lines. The EAROM test calculates the EAROM's checksum, and compares it to the checksum bit stored in the ROM.

FIELD DIAGNOSTICS

The WY-50+ contains four new field diagnostics:

- The System Diagnostic Test, an expanded version of the diagnostic self-test on page 3-2 of the WY-50 Maintenance Manual.
- A Transmit/Receive Test for the communications ports.
- A Keyboard Function Test.
- An Attribute/Character Font Test

The following sections describe the diagnostic procedures, the new error codes, and the new test connectors and cables.

System Diagnostic Test

This test is an expanded version of the power-on self-test. It checks memory, buffers, the CPU, and communications.

Follow these steps to perform the system diagnostic test:

1. Turn off the terminal.
2. Install the system diagnostic test connectors on the AUX and MODEM ports (see page D-4 for connector definitions).
3. Turn on the terminal.
4. Hold down the SHIFT key, then press the SETUP key.
5. Press the cursor DOWN key until the TEST parameter appears on the bottom line of the screen.
6. Press the cursor LEFT key once. The cursor highlights the TEST field.
7. Press the spacebar. This toggles the test field on.
8. Leave setup mode by holding down the SHIFT key and pressing the SETUP key again.
9. Save the selection by pressing the Y key. This starts the diagnostic self-test.

If the system diagnostic test doesn't find any errors, a flashing pattern should appear on the screen.

If it does find an error, the screen will blank and an error code will appear in the lower-right corner of the display. Replace the logic PCB.

Table D-2 lists and describes the system diagnostic test error codes.

Table D-2 System Diagnostic Test Error Codes

Error Message	Error Type
0	Buffer RAM, IC 0
1	Buffer RAM, IC 1 (if memory is expanded)
9	EAROM
R	Row Buffer
K	No initialization on power-up
A	Modem, RTS to CTS
C	Modem, DTR to DCD
E	AUX Ready to AUX RTS
P	Control PROM
Z	8031 processor
X	MODEM port loopback
Y	AUX port loopback

Caution--If you save the ON test parameter, turn off the power, and remove the test connectors, an error condition will result the next time someone turns on the terminal. Remember to default the terminal before returning it to the user.

Follow these steps to stop the system diagnostic test:

1. Hold down the space bar until the flashing pattern stops.
2. Turn the terminal off.
3. Remove the test connectors. Default the terminal.

System Diagnostic Test Connector Definitions--The diagnostic self-test connectors for both the MODEM and the AUX ports are made from 25-pin, male, D-type connectors. (You can find information to order ready-made connector sets under Parts List on page D-10.)

Connect these pins:

MODEM Port	**AUX Port**
Pin 2 to Pin 3 (TxD to RxD)	Pin 2 to Pin 3 (TxD to RxD)
Pin 4 to Pin 5 (RTS to CTS)	Pin 6 to Pin 20 (DSR to DTR)
Pin 8 to Pin 20 (DCD to DTR)	

Tramsmit/Receive Communication Port Test

This test transmits data between the MODEM and AUX ports. If either port doesn't receive or recognize the data from the other port, an error code will appear on the screen.

Follow these steps to perform the test:

1. Turn off the terminal.
2. Install the communication port test cable on the AUX and MODEM ports (see page D-5 for a cable definition).
3. Turn on the terminal.
4. Hold down the SHIFT key, then press the SETUP key.
5. Press the cursor DOWN key until the TEST parameter appears on the bottom line of the screen.
6. Press the cursor LEFT key once. The cursor highlights the TEST field.
7. Press the spacebar. This toggles the test field on.
8. Leave setup by holding down the SHIFT key and pressing the SETUP key again.
9. Save the selection by pressing the Y key. This starts the communications port test.

   If the communication port test doesn't find any errors, a flashing test pattern should appear on the screen.

   If the communication port test does find an error, the screen will blank and an error code will appear in the lower-right corner of the display. Replace the logic PCB. Table D-3 lists and describes the error codes.

Table D-3 Transmit/Receive Communication Port Test Error Codes

Error Message	Error Type
W	Xmit/Rcv error, MODEM to AUX
Z	Xmit/Rcv error, AUX to MODEM

Note--Error messages listed on other tables may appear when this test runs, but most errors will be those listed above.

Caution--If you save the ON test parameter, turn off the power, and remove the test connectors, an error condition will result the next time someone turns on the terminal. Remember to default the terminal before returning it to the user.

Follow these steps to stop the test:

1. Hold down the SETUP key until the flashing pattern stops.
2. Turn the terminal off.
3. Remove the test cable. Default the terminal.

Transmit/Receive Communication Port Test Cable Definitions--The transmit/receive communication port test cable requires two 25-pin, male, D-type connectors, and wire to connect pins on each connector and to connect the two connectors together. (You can find information to order ready-made cables under Parts List on page D-10.)

Connect these pins:

MODEM Port (DTE)		**AUX Port (DCE)**
Pin 2 (TxD)	to	Pin 2 (RxD)
Pin 3 (RxD)	to	Pin 3 (TxD)
Pins 4 to 5		Pins 6 to 20
Pins 8 to 20		

Keyboard Function Test

The keyboard function test checks the keyboard.

Note--The keyboard function test does not test the following keys: SHIFT, FUNCT, CAPS LOCK, SETUP, BREAK, or CTRL. If you press ENTER, the terminal will return to the system diagnostic test. Pressing function keys F1 through F16 will change attributes on portions of the test screen.

Follow these instructions to perform the keyboard test:

1. Start the system diagnostic test described on page D-2.

2. Hold down the space bar until the test pattern stops flashing.

3. Hold down the CTRL key, then press the A key until you see the screen in Figure D-1.

4. Find the bottom line of "m"s. Press the letter keys that you are testing, and watch the letters change in the middle of the bottom line.

   If the letter keys in question don't work, replace the keyboard PCB.

   If the letters do change during the test, but fail to respond during normal operation, check the logic PCB or the computer.

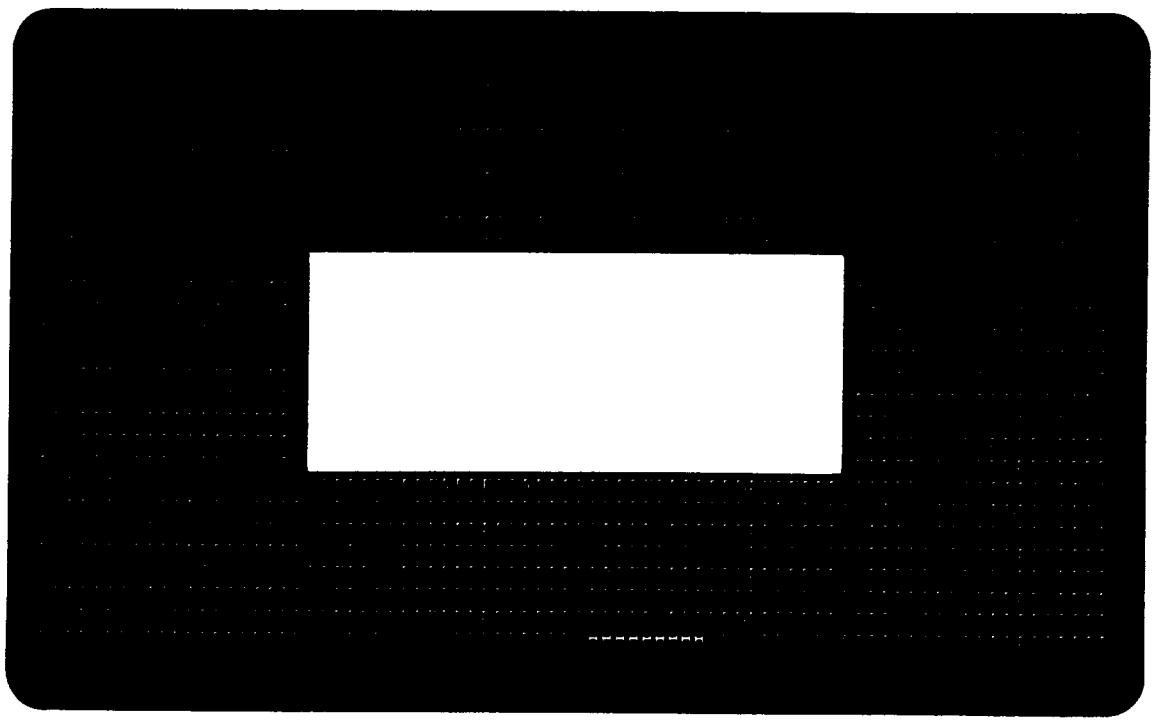
Follow these steps to stop the test:

1. Press the SETUP key until the flashing pattern stops.

2. Turn the terminal off.

3. Remove the test connectors. Default the terminal.

Figure D-1 Keyboard Function Test Pattern



Attribute/Character Font Test

This test allows you to check all the attributes and the character font.

Follow these steps to perform the test:

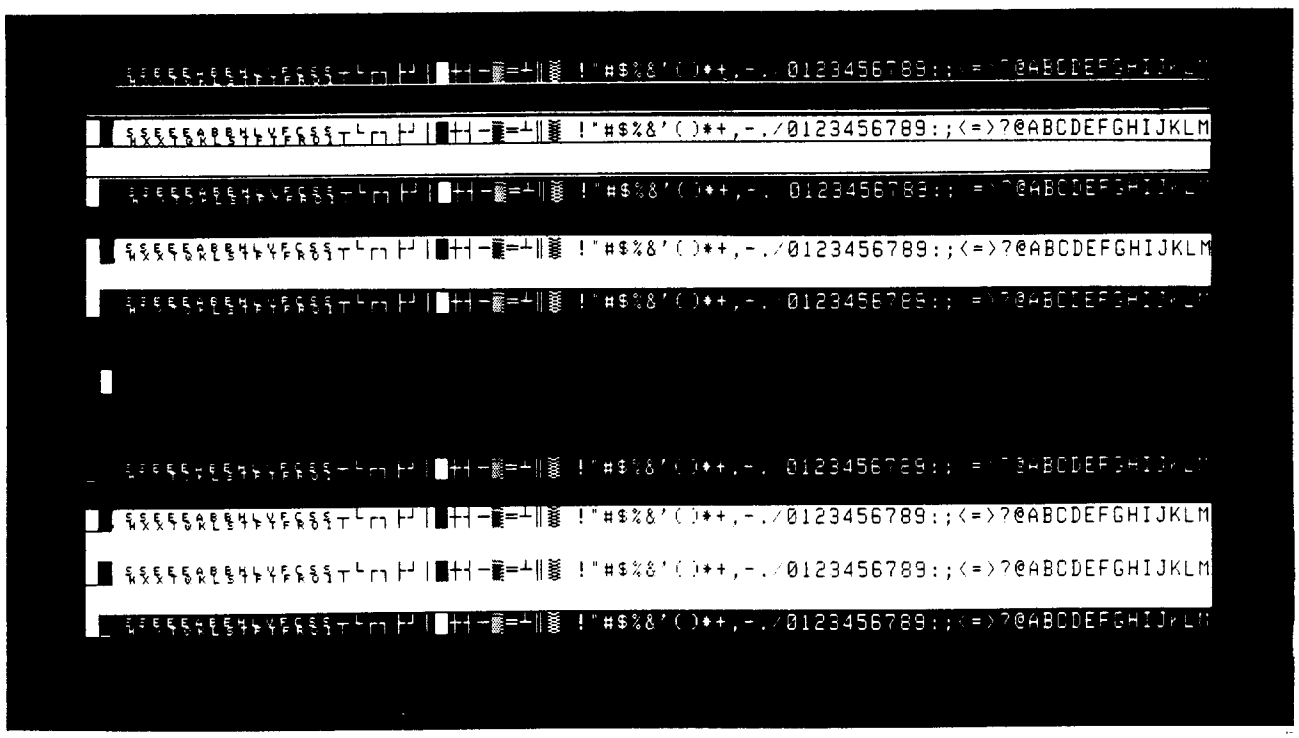
1. Start the system diagnostic test described on page D-2.
2. Hold the SETUP key down until the test pattern stops flashing.
3. Hold the CTRL key down, then press the A key until you see the screen in Figure D-2.
4. Look for the following features:

   Attributes: Normal, Blank, Blink, Underline, Dim, and Reverse

   A full character set

   If one or more of the features doesn't appear, replace the logic PCB.

Figure D-2 Attribute/Character Font Test Pattern



Follow these steps to stop the test:

1. Press the SETUP key until the flashing pattern stops.

2. Turn the terminal off.

3. Remove the test connectors. Default the terminal.

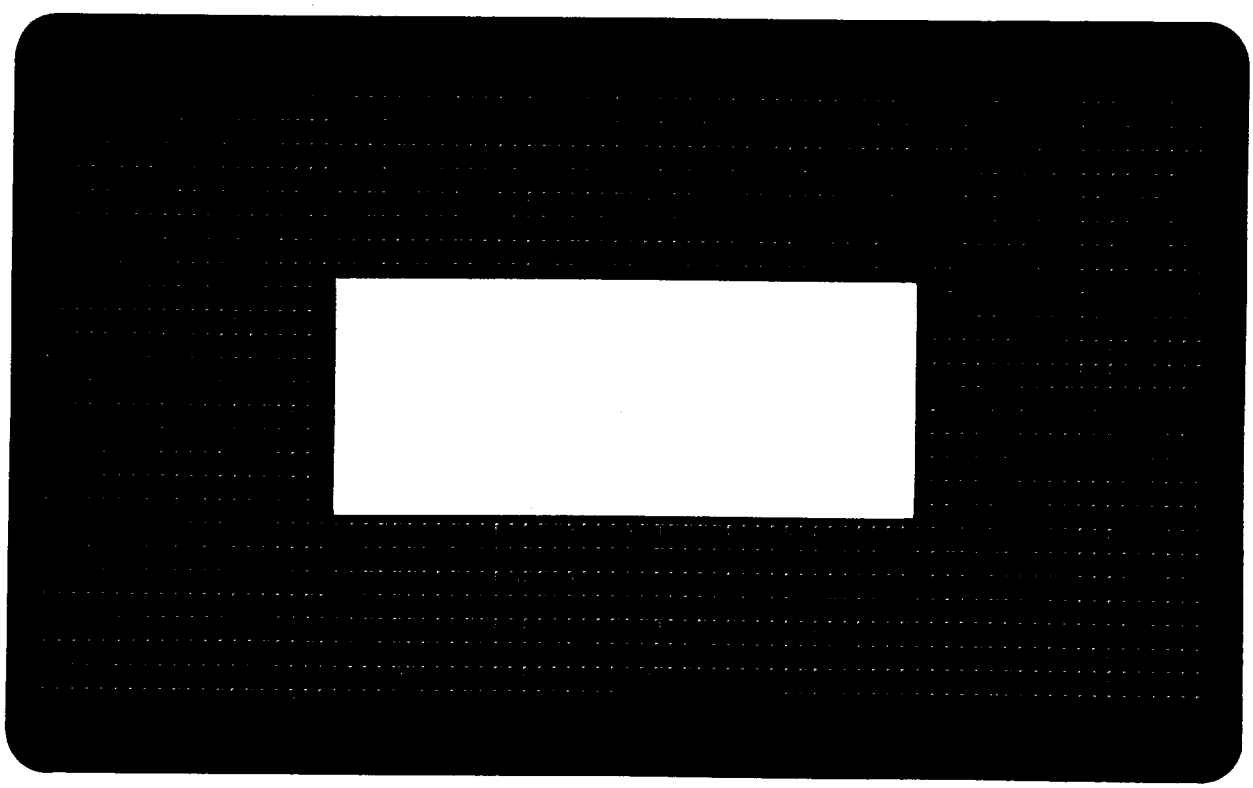
ALIGNMENT AND ADJUSTMENT

This terminal has two new test patterns, which you can call to align the display more accurately and quickly: Pattern M and Pattern O.

Pattern M

Pattern M helps you detect and correct linearity, brightness, and focus (see Figure D-3). This pattern is an 80-column display of characters. Two blocks in the center of the pattern indicate brightness: dim and normal.

Figure D-3 Pattern M



Pattern 0

Pattern 0 helps you detect and correct pincushion, tilt, centering, and size problems (see Figure D-4). This pattern is a full-reverse, normal brightness display in 80-column format. Two pairs of parallel lines cross in the center, making four quadrants. Two additional vertical lines, one on either side of the pattern, indicate brightness intensity levels.

Note--You can verify the display tolerances using a display reticle, available from WYSE, Part No. 09-001-03. Instructions to use the reticle are included with it.

Figure D-4 Pattern 0

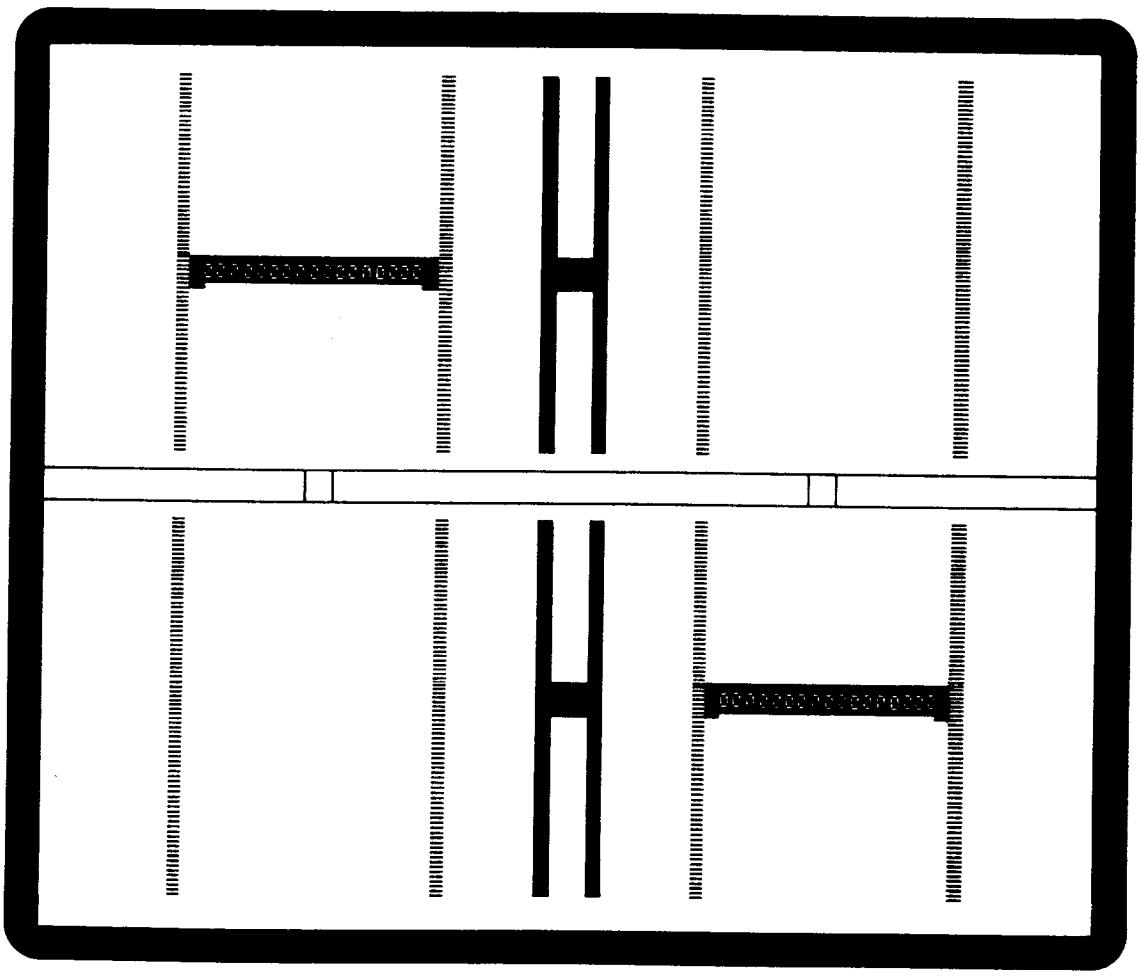


Table D-4 lists adjustments, display problems, and the pattern that is best suited to make the adjustment.

Table D-4 Test Pattern Problems and Adjustments

Test Pattern	Display Problems	Adjustments
M	Letters at the top of the display aren't the same height as those at the bottom of the display	Linearity
M	Fuzzy letters	Focus
M	Too bright; too dim; raster scan lines show	Brightness
O	Too short or too tall	Height
O	Too wide or too narrow	Width
O	Not centered	Centering
O	Not level	Yoke Lock
O	Pincushioning, barreling, crooked edges, corners sag or move out of tolerance	Display magnets

PARTS LIST

The WY-50+ contains three new assemblies that differ from the standard WY-50 terminal: the Logic PCB, the Monitor/Power Supply PCB, and the Amber CRT. The terminal also comes with test connectors and cables. You can order all other replaceable units with the spare part numbers assigned to the WY-50.

Part Number	Description
840293-01	WY-50+ Logic PCB
99-019-02	WY-50+ Monitor/Power PCB
780026-01	WY-50+ Amber CRT
94-0233-01	WY-50+ System Diagnostic Test Connector Set
94-0238-01	WY-50+ Transmit/Receive Comm Port Test Cable
09-001-03	WY-50+ Display Reticle

SCHEMATICS

See Appendix C, "Schematics," to find schematic diagrams of the WY-50+ Logic PCB and Monitor/Power Supply PCB.

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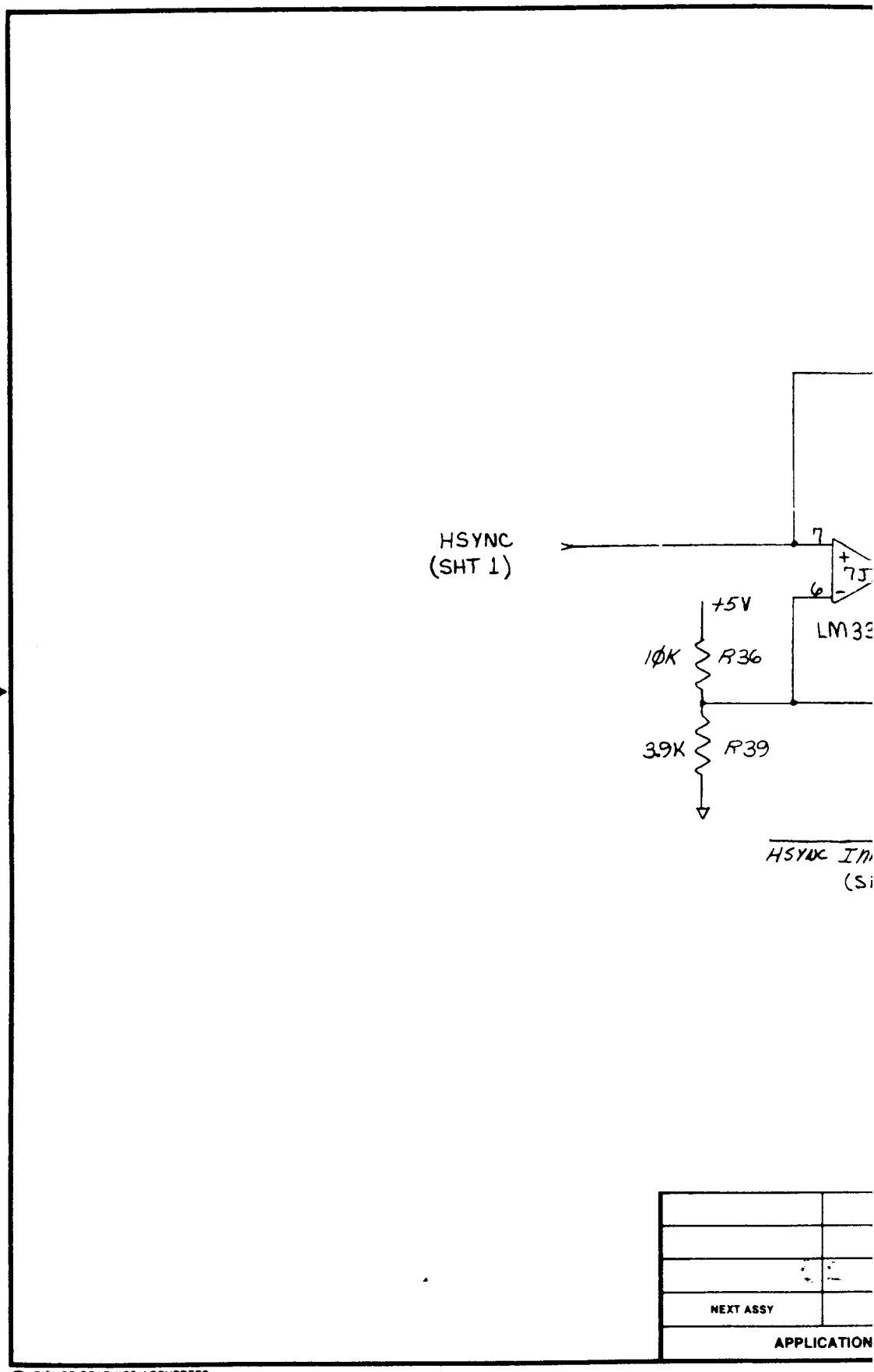

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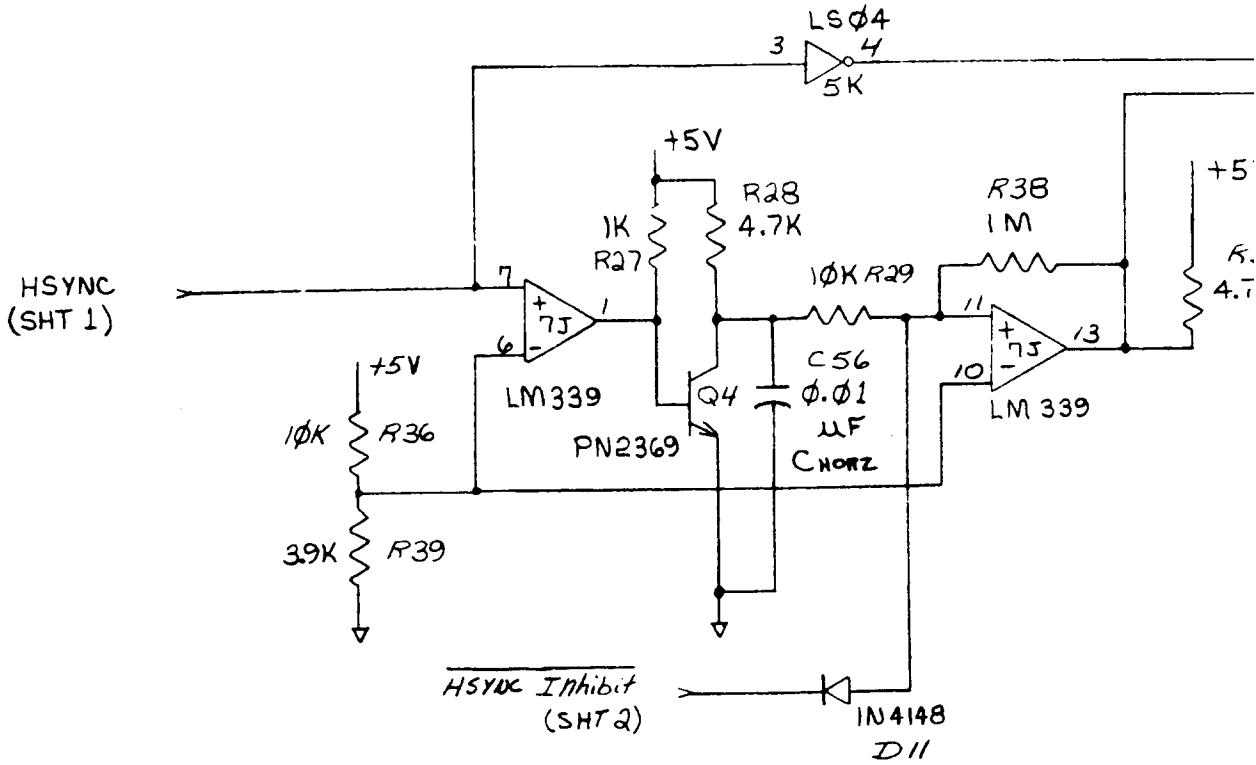
REORDER NO. A19930



	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	

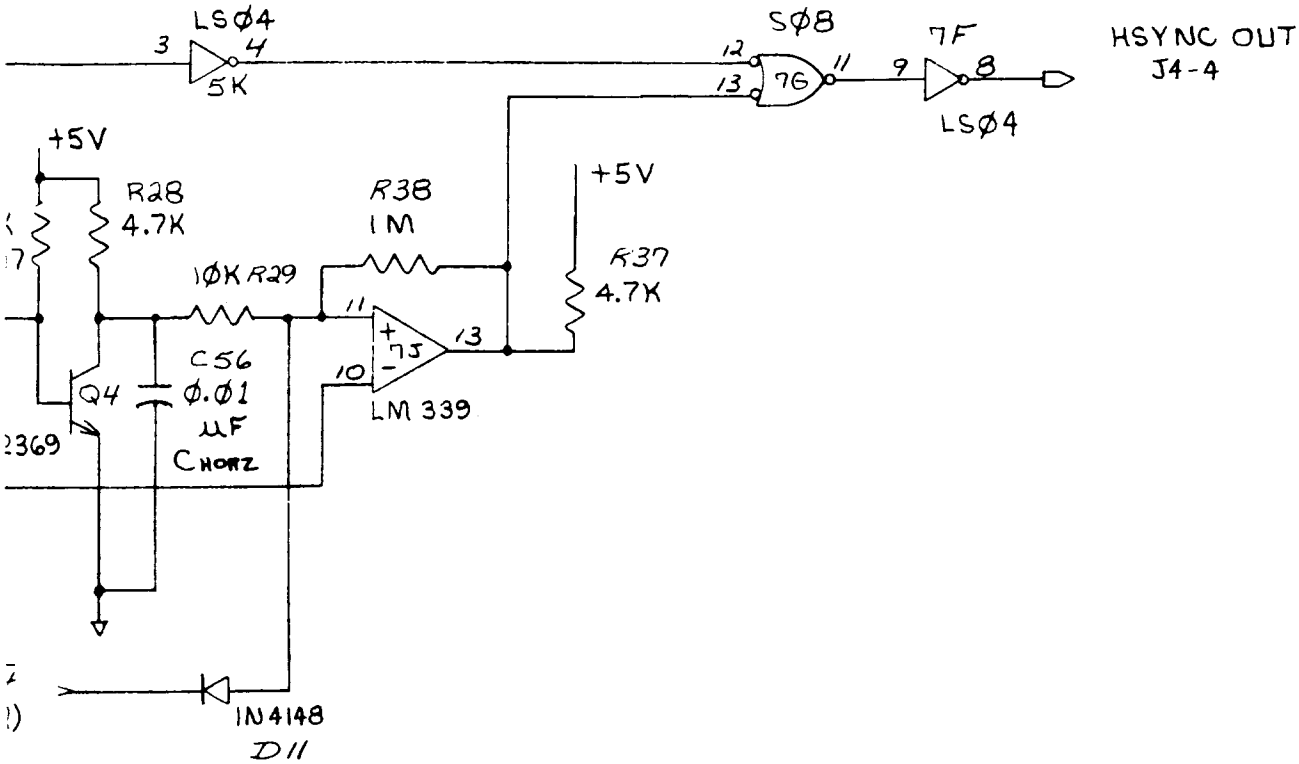
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.
MATERIAL	APPROVALS
	DRAWN
	CHECKED
FINISH	ISSUED
DO NOT SCALE DRAWING	

NEXT ASSY	USED ON
APPLICATION	

SS

DWG. NO.	SH	REV.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

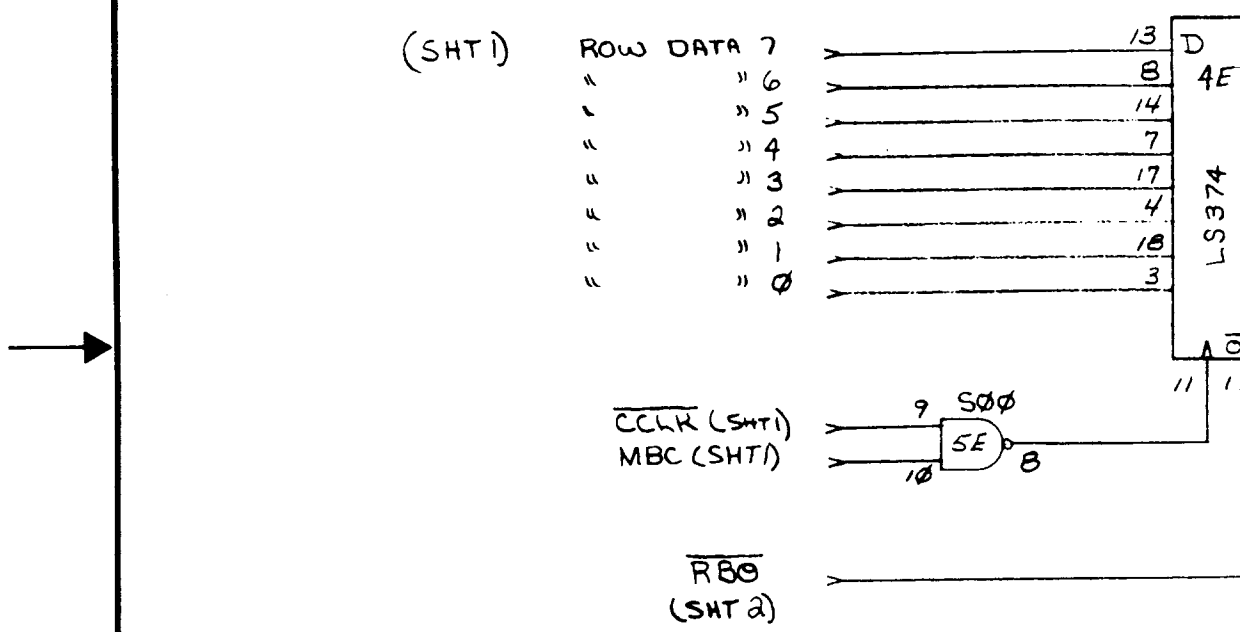


HSYNC STRETCHER

	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

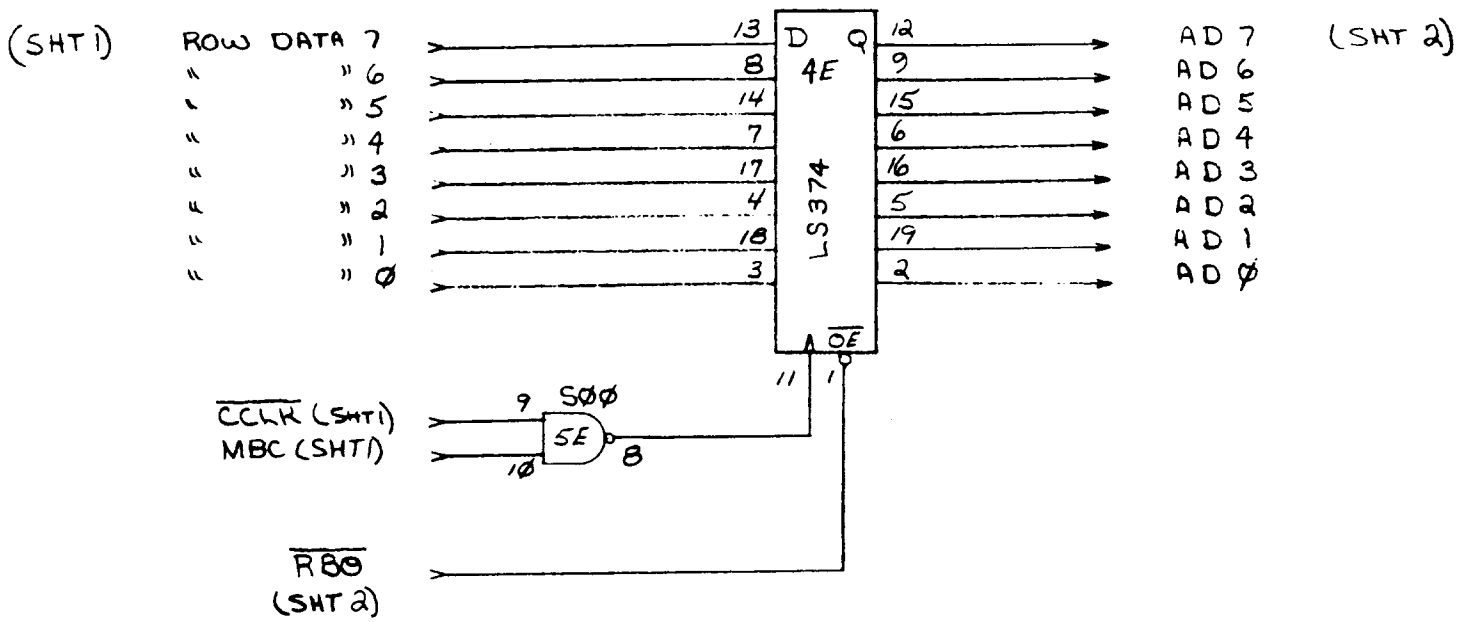
PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.	WYSE TECHNOLOGY	
MATERIAL	APPROVALS / DRAWN	DATE	LOGIC BOARD, WY 5Ø
FINISH	CHECKED		SIZE B / FSCM NO. / DWG. NO. 96-Ø12-Ø1 / REV. D3
DO NOT SCALE DRAWING	ISSUED		SCALE / SHEET 6 of 7



NEXT ASSY	
APPLICATION	

BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A19930



	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.
MATERIAL	APPROVALS
FINISH	DRAWN
	CHECKED
	ISSUED
DO NOT SCALE DRAWING	

NEXT ASSY	USED ON
APPLICATION	

DWG. NO.	SH	REV.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

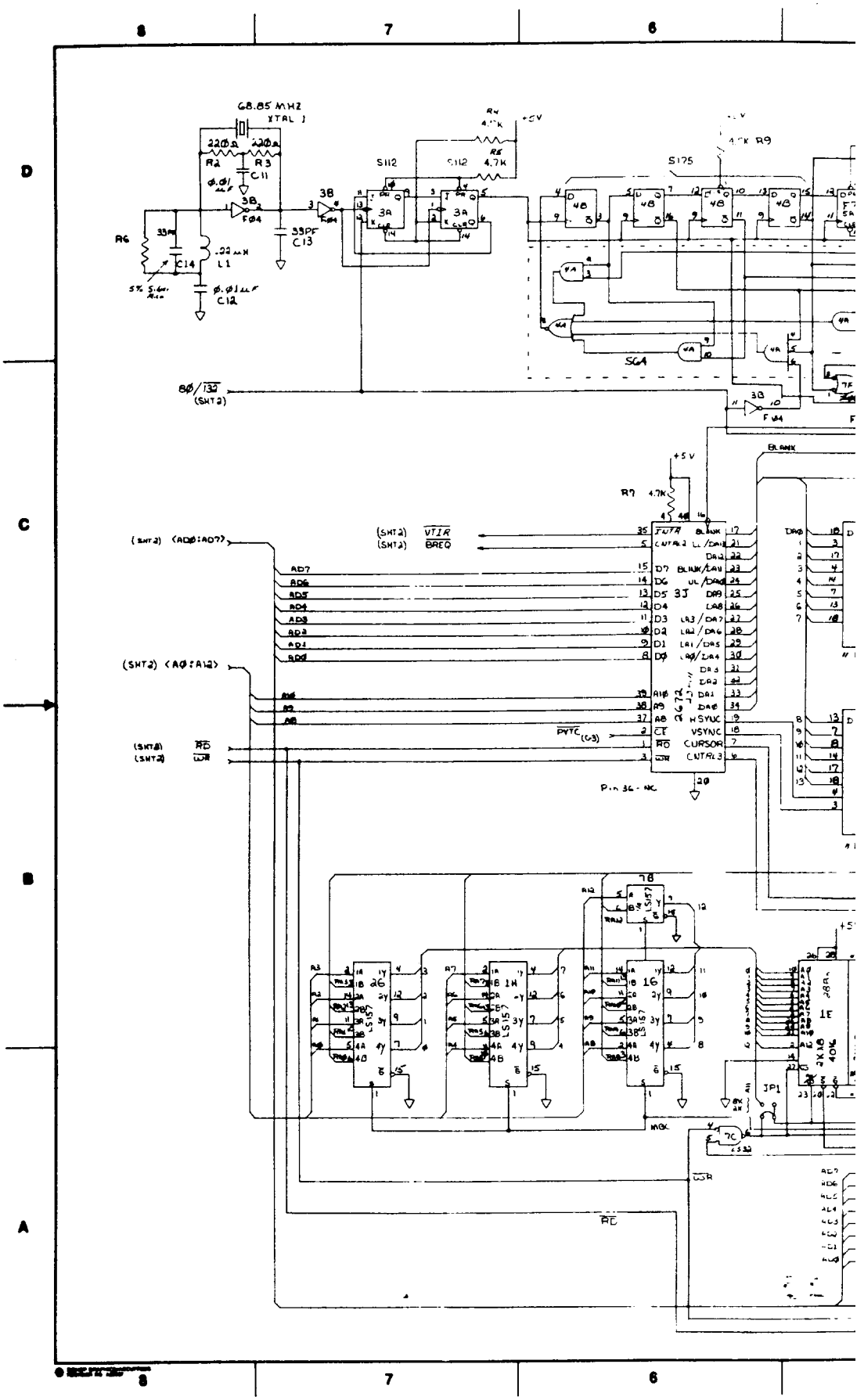
12 → AD 7 (SHT 2)
9 → AD 6
15 → AD 5
6 → AD 4
16 → AD 3
5 → AD 2
19 → AD 1
2 → AD Ø

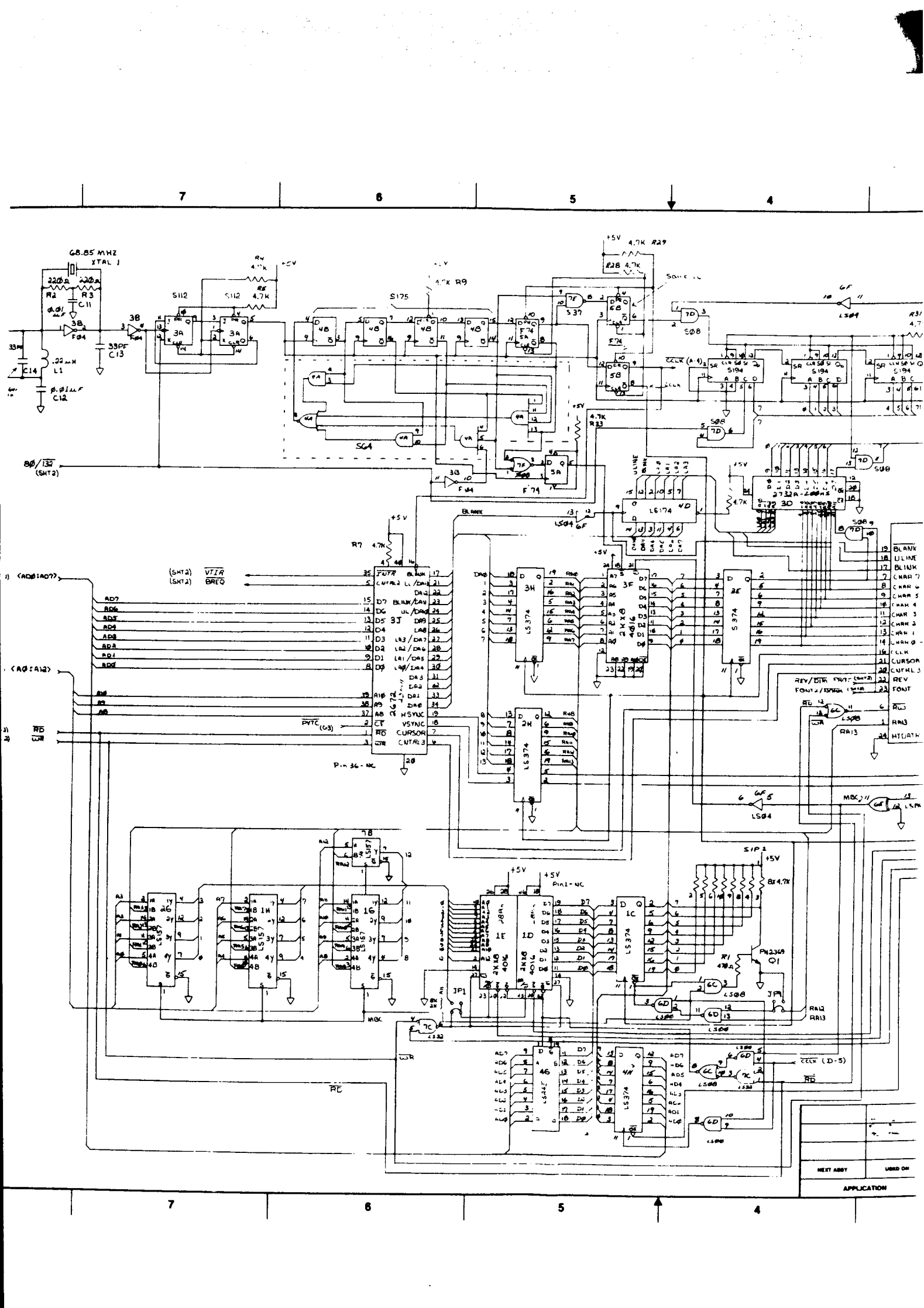
ROW BUFFER DIAGNOSTIC REGISTER.

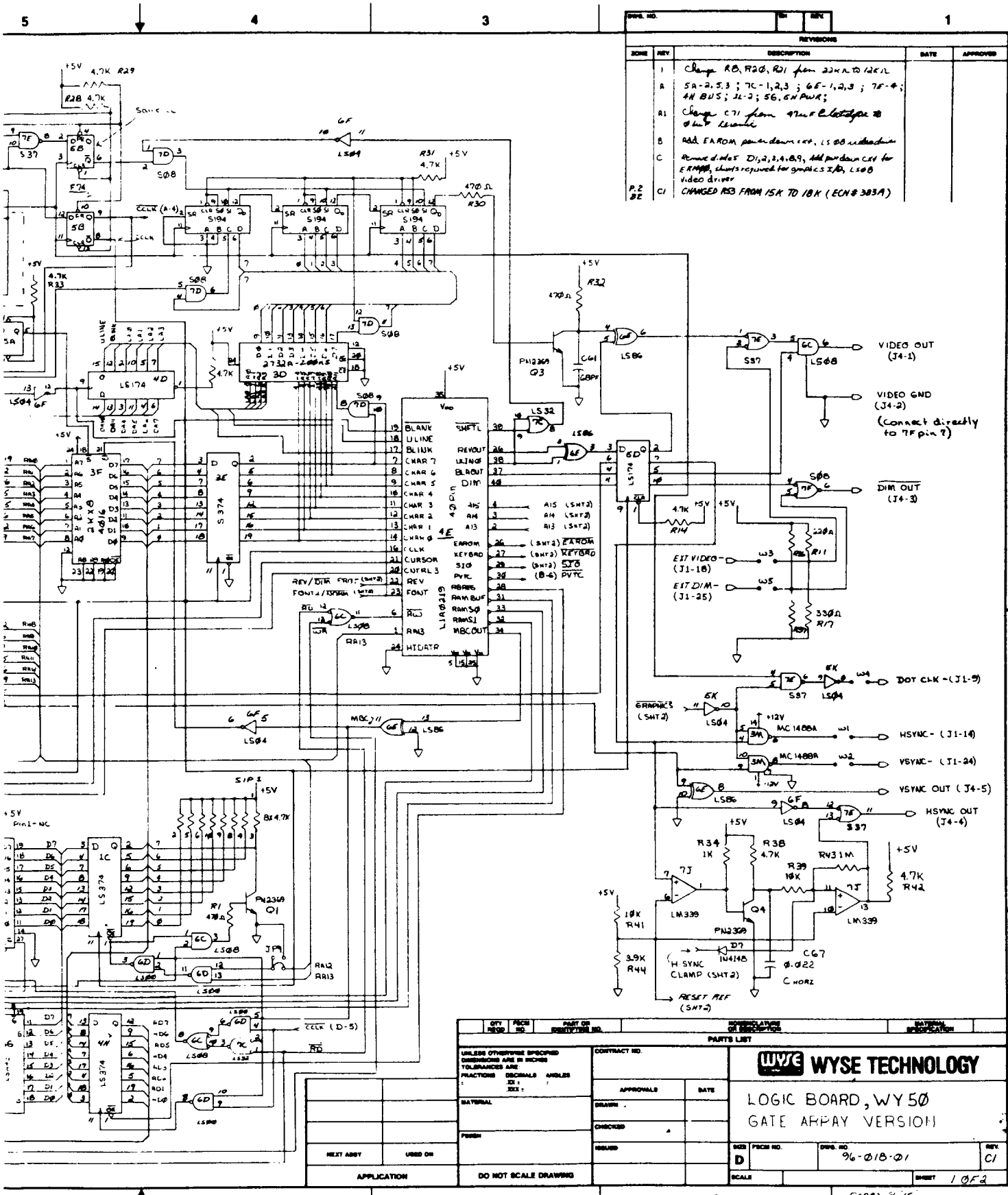
	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

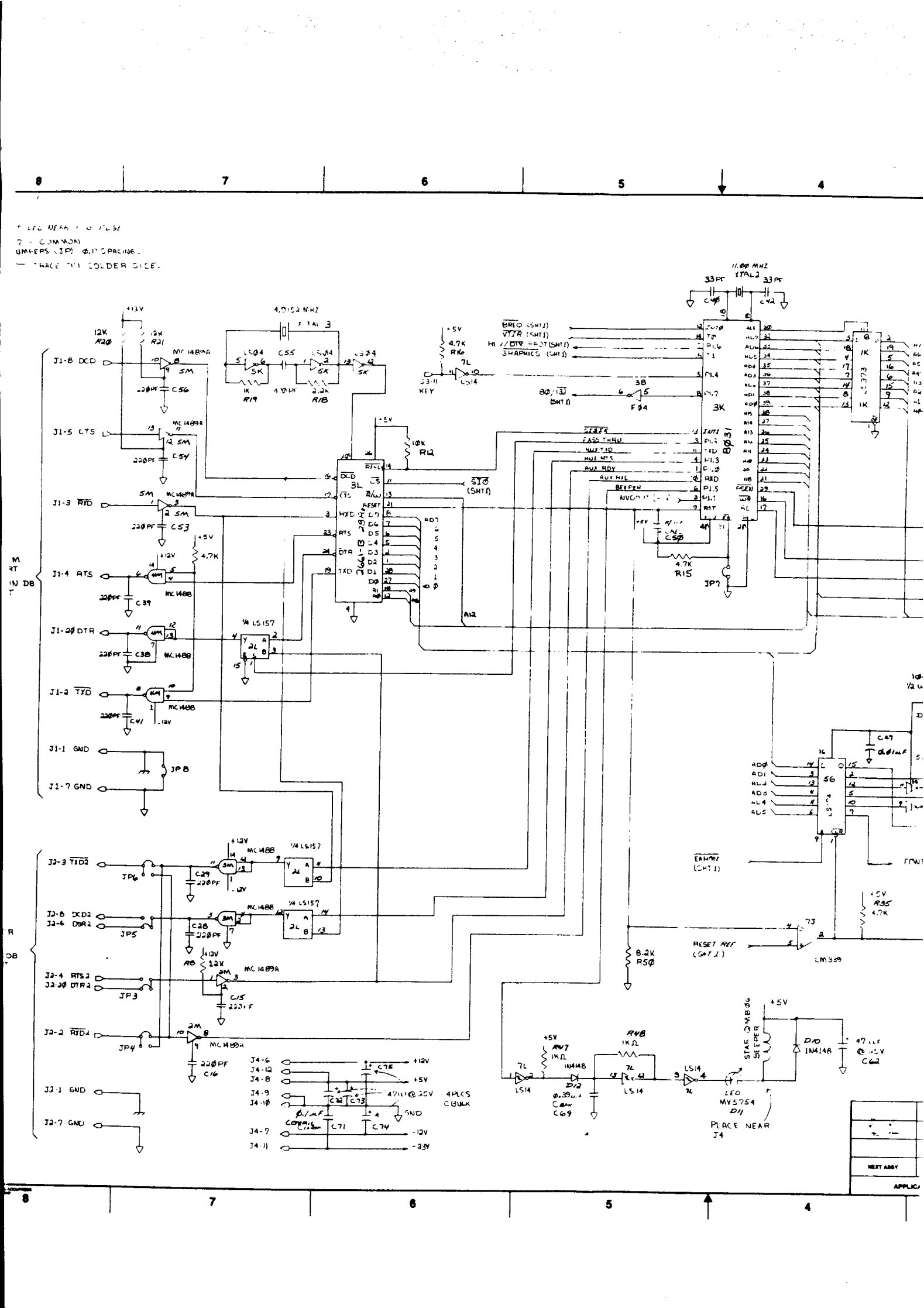
PARTS LIST

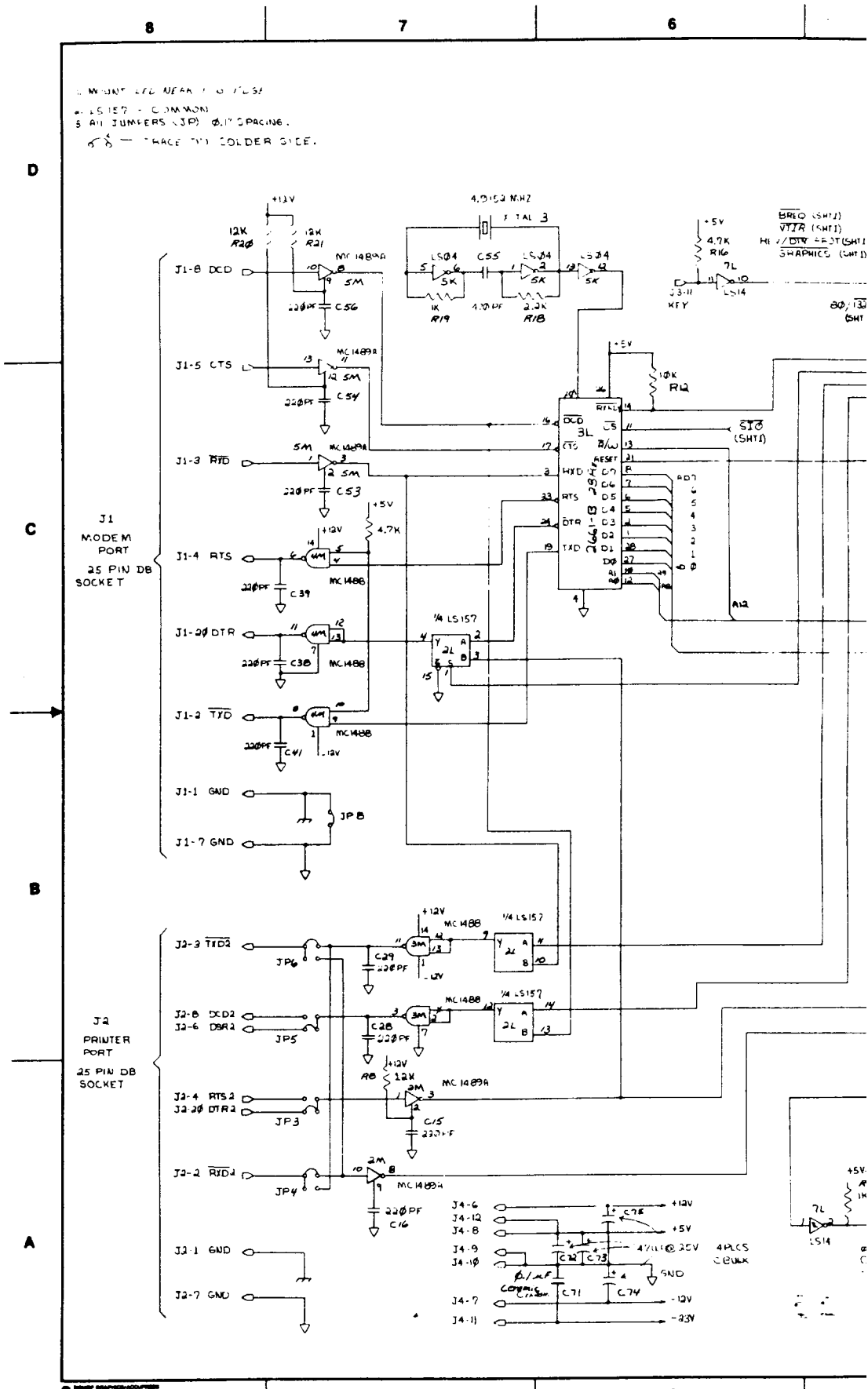
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.	WYSE TECHNOLOGY	
MATERIAL	APPROVALS / DRAWN	DATE	LOGIC BOARD, WY50
FINISH	CHECKED		SIZE B / FSCM NO. / DWG. NO. 96-012-01 / REV. D3
DO NOT SCALE DRAWING	ISSUED		SCALE / SHEET 7 of 7

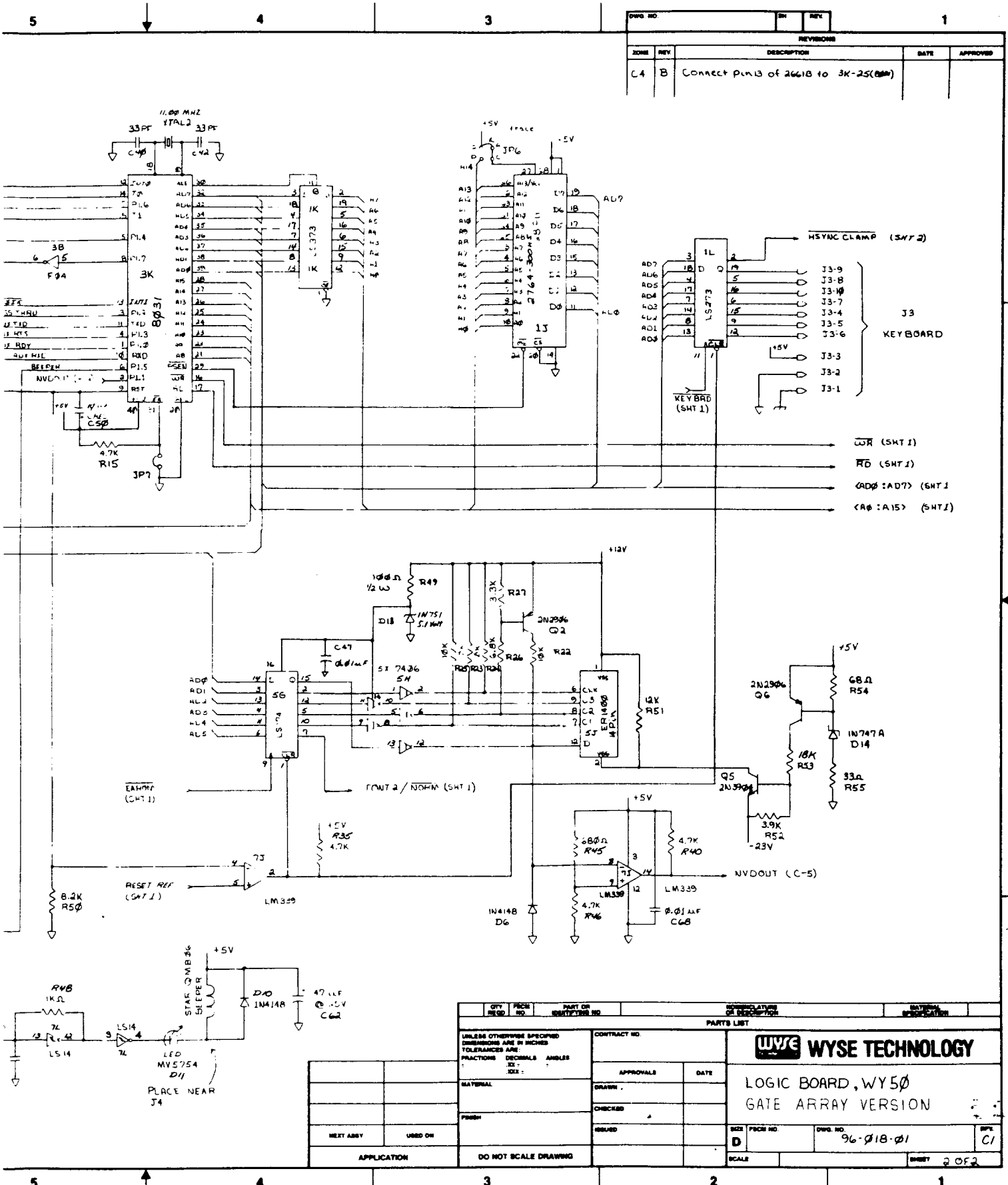

8
7
6
D
C
B
A
68.85 MHZ
XTAL 1
220Ω
R2
R3
C11
.01 µF
3B
F Ø4
33PF
C13
R6
33Ω
C14
.22 µH
L1
5% Silver Mica
.01 µF
C12
S112
4.7K
S175
SG4
BØ/132
(SHT2)
+5V
R9
R7 4.7K
BLANK
(SHT2) VTIR
(SHT2) BREQ
(SHT2) (AD0:AD7)
(SHT2) (A0:A12)
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
D7
D6
D5
D4
D3
D2
D1
D0
3J
HSYNC
VSYNC
CURSOR
PVTC (C3)
Pin 36 - NC
(SHT8) RD
(SHT2) WR
JP1
WRX
RD
WR
1E


7
6
5
4
68.85 MHZ
XTAL 1
220Ω
R2
R3
C11
.01 µF
C14
.22 mH
L1
.01 µF
C12
33PF
C13
S112
4.7K
R4
R5
S175
4.7K R9
4.7K R29
R28 4.7K
S37
S74
S194
S08
LS04
4.7K
R33
SG4
BØ/132
(SHT2)
F04
F74
BLANK
LINE
LS174
4D
2732A-200NS
3D
+5V
R7 4.7K
(SHT2) VTIR
(SHT2) BREQ
(AD0:AD7)
(A0:A12)
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
RD
WR
2K X 8
4016
LS374
3H
3F
3E
3J
3K
2H
2G
2F
2E
2D
2C
2B
2A
1H
1G
1F
1E
1D
1C
1B
1A
LS157
LS367
LS245
LS08
LS32
LS00
PN2369
Q1
R1
470Ω
8x4.7K
SIP 1
JP1
JP2
MBK
RA12
RA13
RA3
HTDATH
CHAR 7
CHAR 6
CHAR 5
CHAR 4
CHAR 3
CHAR 2
CHAR 1
CHAR 0
CLK
CURSOR
CNTRL 3
REV
FONT
Pin 36 - NC
Pin 1 - NC
NEXT ASSY
USED ON
APPLICATION


REVISIONS
ZONE REV DESCRIPTION DATE APPROVED
1 Change R8, R20, R21 from 22KΩ TO 12KΩ
A 5A-2,5,3 ; 7C-1,2,3 ; 6E-1,2,3 ; 7F-4 ; 4H BUS ; 3L-2 ; 5G, 6N PWR ;
A1 Change C71 from .47uF electrolytic to .1uF ceramic
B Add EAROM power down ckt, LS08 added
C Remove diodes D1,2,3,4,8,9, Add pwr down ckt for EAROM, shunts required for graphics I/O, LS08 video driver
P.2 B2 C1 CHANGED R53 FROM 15K TO 18K (ECN# 383A)
WYSE TECHNOLOGY
LOGIC BOARD, WY50
GATE ARRAY VERSION
96-018-01
C1
1 OF 2
VIDEO OUT (J4-1)
VIDEO GND (J4-2)
(Connect directly to 7F pin 7)
DIM OUT (J4-3)
EXT VIDEO- (J1-18)
EXT DIM- (J1-25)
DOT CLK -(J1-9)
HSYNC- (J1-14)
VSYNC- (J1-24)
VSYNC OUT (J4-5)
HSYNC OUT (J4-4)
H SYNC CLAMP (SHT2)
RESET REF (SHT2)
PARTS LIST
APPLICATION
DO NOT SCALE DRAWING


8
7
6
5
4
11.00 MHZ XTAL 2
33PF
33PF
C42
C40
4.0152 MHZ XTAL 3
+13V
+5V
+12V
-12V
-13V
12K R20
12K R21
MC1489A
MC1488
LS04
LS14
LS34
5K
1K R19
470PF C55
2.2K R18
4.7K R16
7L
LS14
S3-11 KEY
BREQ (SHT1)
VTIR (SHT1)
HI // DTR RESET (SHT1)
SHARPNICS (SHT1)
3B
F04
80/132 (SHT1)
3K
8031
P1.6
P1.7
P1.4
P1.3
P1.2
P1.1
P1.5
P1.0
RST
RXD
TXD
ALE
PSEN
EA
XTAL1
XTAL2
74373
1K
10K R12
3L
2661-B
RTS
CTS
DCD
DTR
TXD
RXD
RESET
R/W
CS
D7
D6
D5
D4
D3
D2
D1
D0
RD7
SIO (SHT1)
FASS THRU
AUX TXD
AUX RTS
AUX RDY
AUX RXC
BEEPER
NVRAM (SHT1)
4.7K R15
JP7
C58
J1-8 DCD
J1-5 CTS
J1-3 RXD
J1-4 RTS
J1-20 DTR
J1-2 TXD
J1-1 GND
J1-7 GND
220PF C56
220PF C54
220PF C53
220PF C39
220PF C38
220PF C41
JP8
1/4 LS157
2L
J2-3 TXD2
J2-8 DCD2
J2-6 DSR2
J2-4 RTS2
J2-20 DTR2
J2-2 RXD2
J2-1 GND
J2-7 GND
JP6
JP5
JP3
JP4
C29 220PF
C28 220PF
C15 220PF
C16 220PF
12K R8
C47 .001uF
56
LS374
ADØ
AD1
AD2
AD3
AD4
AD5
EAWAIT (SHT1)
RESET REF (SHT1)
8.2K R50
7J
+5V R35 4.7K
LM339
J4-6
J4-12
J4-8
J4-9
J4-10
J4-7
J4-11
C75
C72
C73
C71
C74
47uF@35V 4PLCS
.1uF COMM
GND
+12V
+5V
-12V
-13V
C BULK
+5V
R47 1K Ω
R48 1K Ω
1N4148
D12
.039uF COM C69
7L
LS14
LS14
LS14
STAT QMB36 SLEEPER
D10 1N4148
47uF @ 25V C62
LED MV5754 D11
PLACE NEAR J4
NEXT ASSY
APPLIC


8
7
6
D
C
B
A
J1
MODEM
PORT
25 PIN DB
SOCKET
J1-8 DCD
J1-5 CTS
J1-3 RXD
J1-4 RTS
J1-20 DTR
J1-2 TXD
J1-1 GND
J1-7 GND
J2
PRINTER
PORT
25 PIN DB
SOCKET
J2-3 TXD2
J2-8 DCD2
J2-6 DSR2
J2-4 RTS2
J2-20 DTR2
J2-2 RXD2
J2-1 GND
J2-7 GND
JP8
JP6
JP5
JP3
JP4
MC1488
MC1489A
1/4 LS157
2661-B
4.9152 MHz
XTAL 3
LS04
LS14
+12V
+5V
-12V
-9V
GND
4PLCS
C BULK
KEY
J3-11
BRKD (SHT1)
VTXR (SHT1)
SIO (SHT1)
(SHT1)



ZONE	REV	DESCRIPTION	DATE	APPROVED
C4	B	Connect Pin13 of 2661B to 3K-25(8MHz)		

QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
.XX ±
.XXX ±

CONTRACT NO.

APPROVALS	DATE
DRAWN	
CHECKED	
ISSUED	

MATERIAL

FINISH

NEXT ASSY	USED ON
APPLICATION	

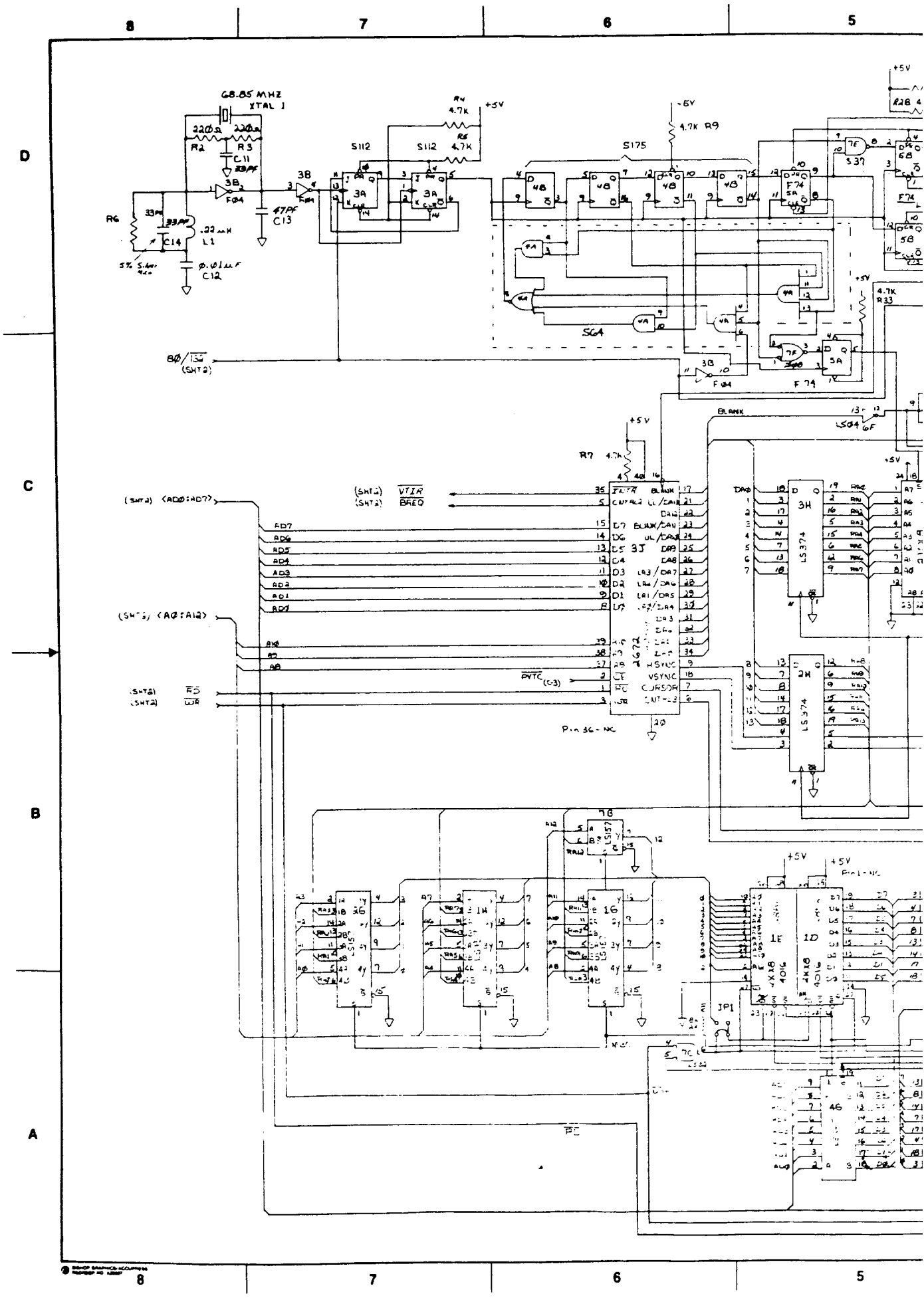
DO NOT SCALE DRAWING

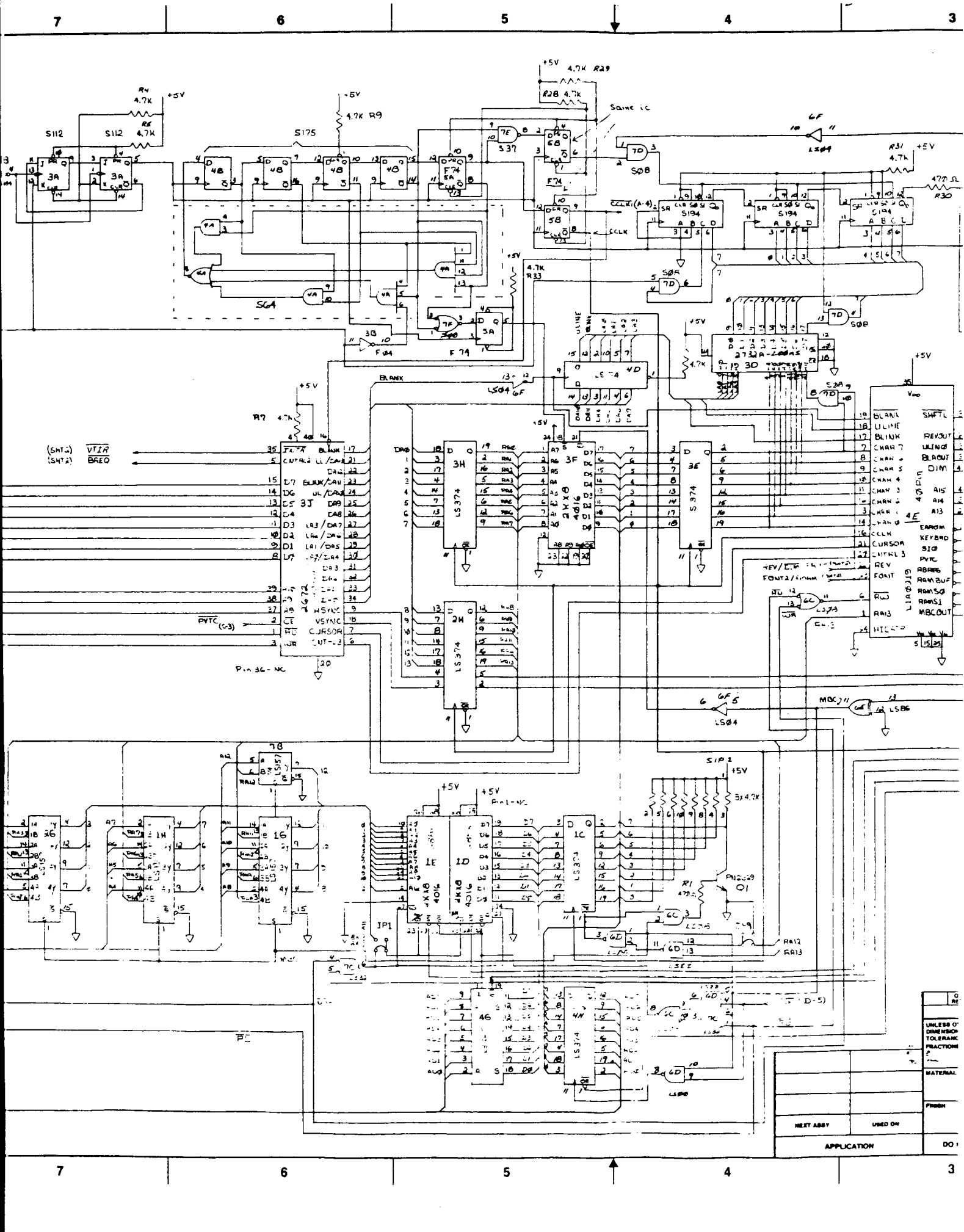
WYSE TECHNOLOGY

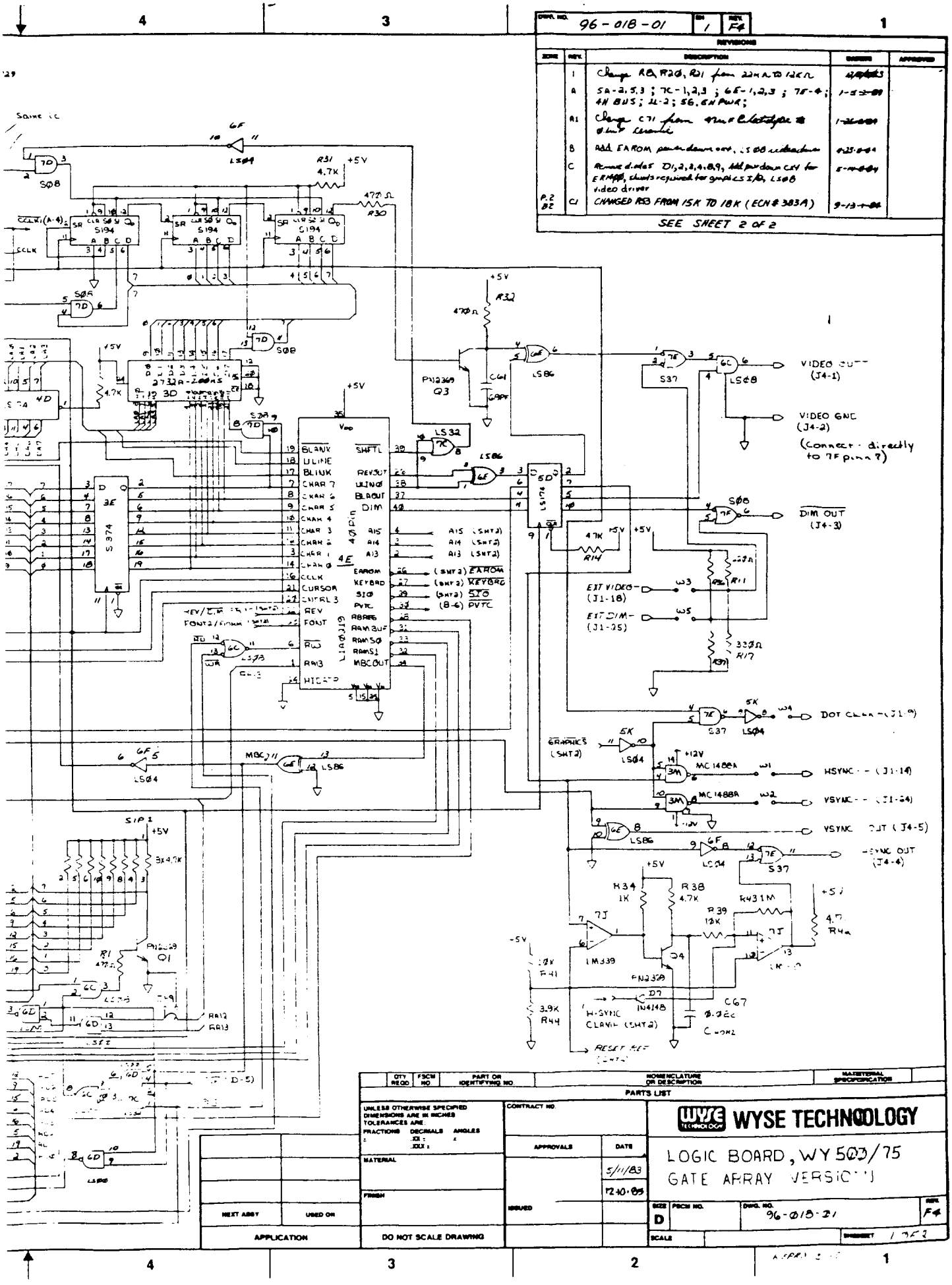
LOGIC BOARD, WY50
GATE ARRAY VERSION

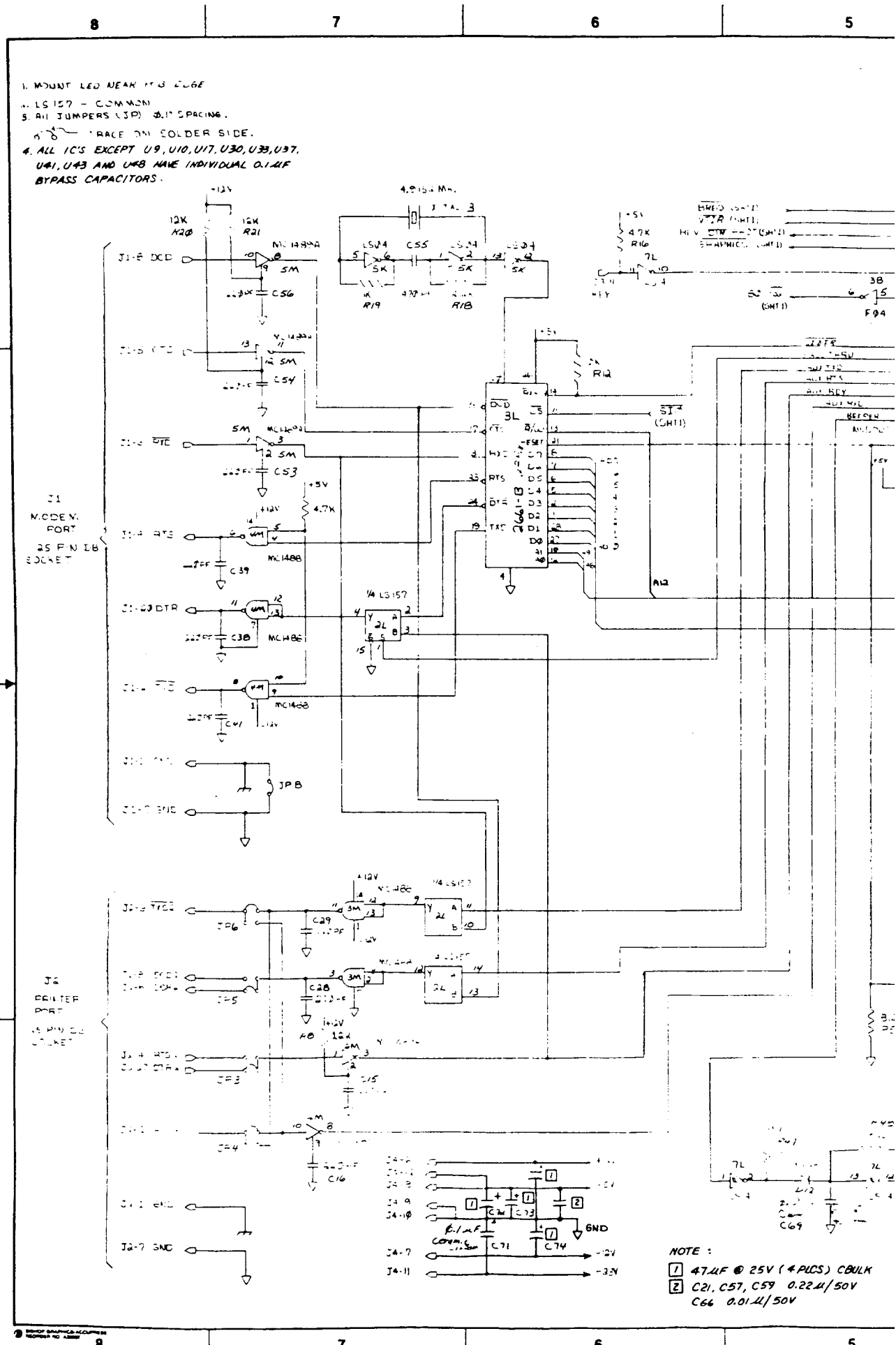
SIZE	FSCM NO.	DWG. NO.	REV.
D		96-018-01	C1

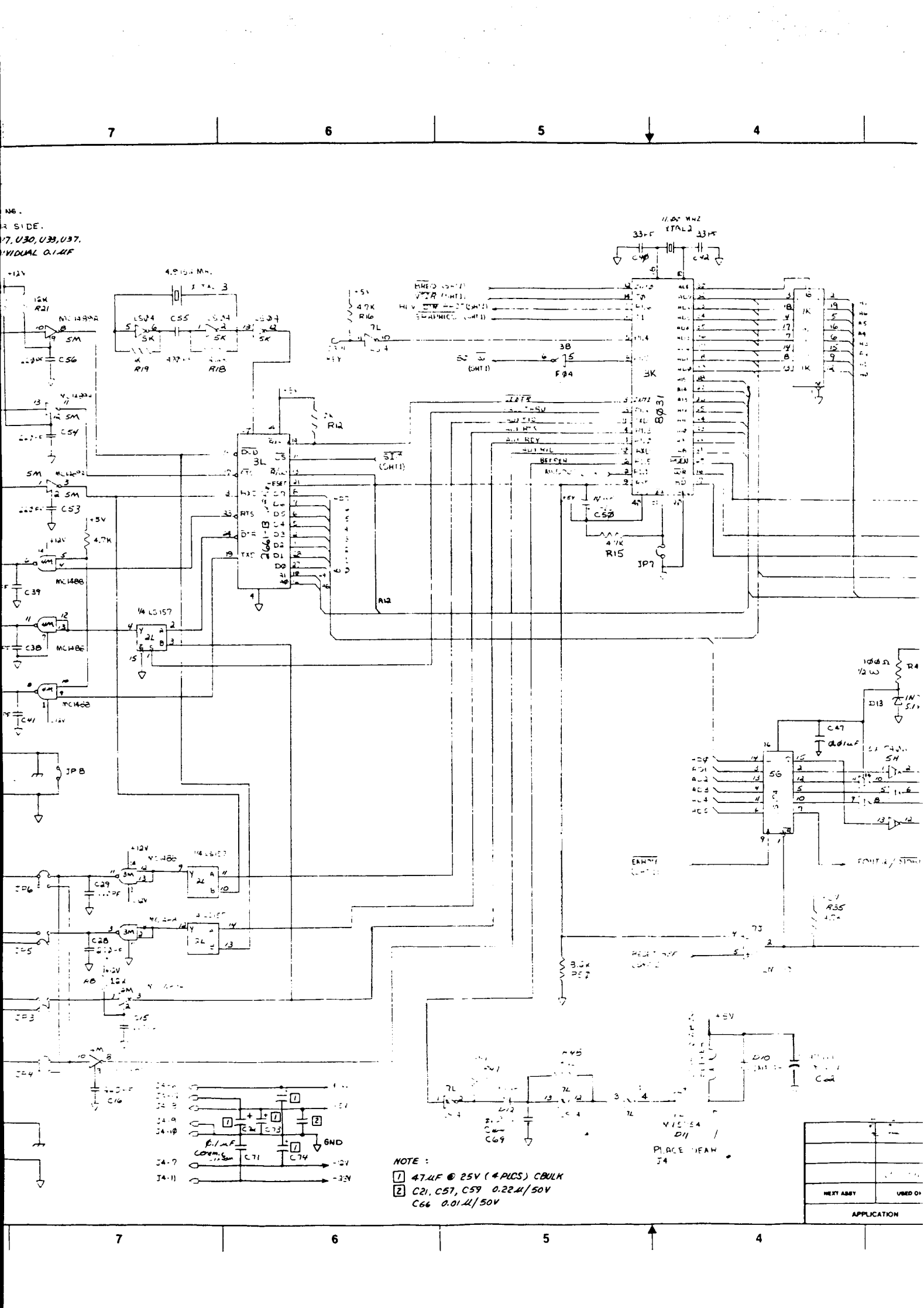
SCALE | SHEET 2 OF 2

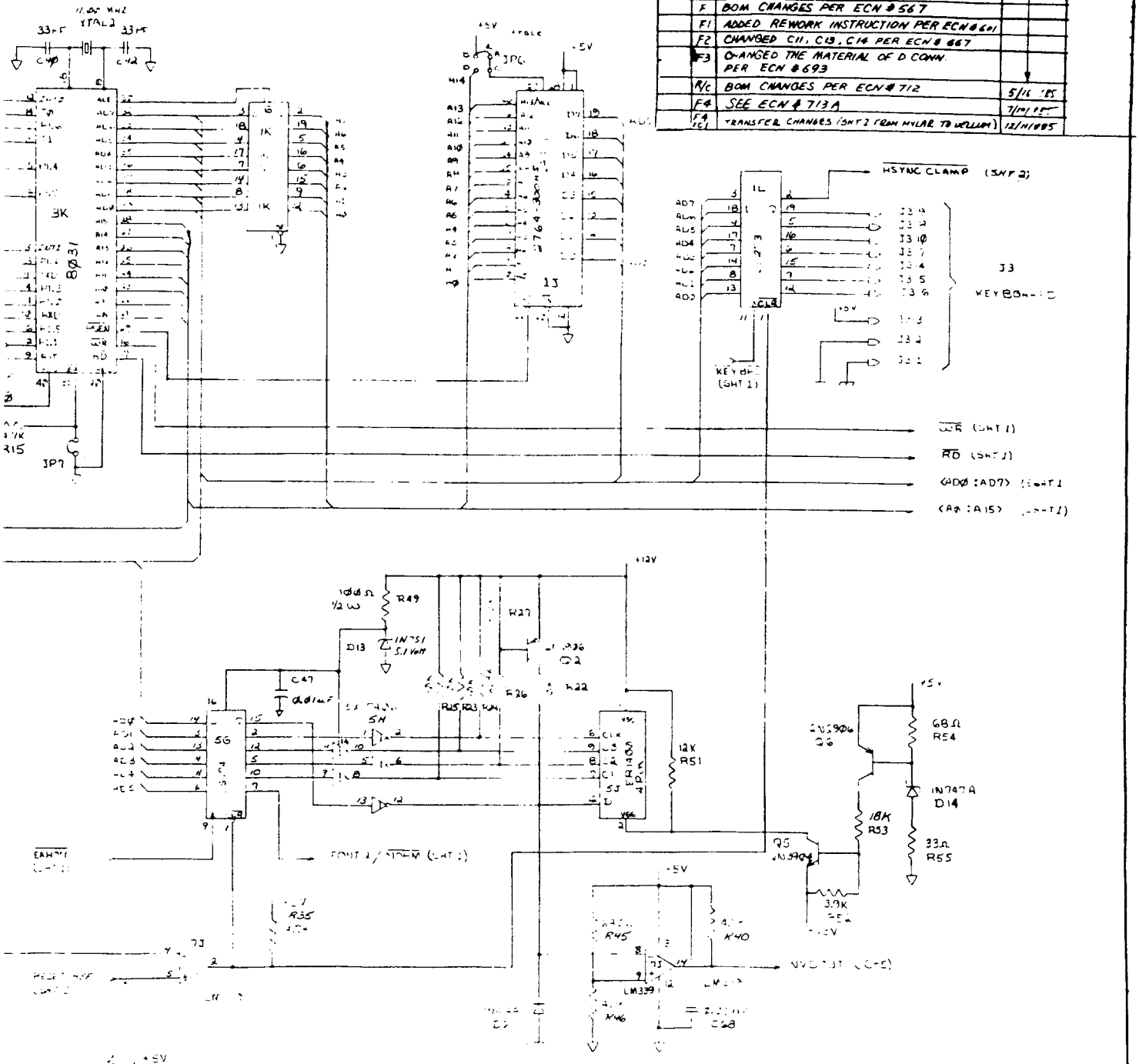

8
7
6
5
D
C
B
A
68.85 MHZ
XTAL 1
220Ω
R2
R3
C11
33PF
R6
33PF
C14
.22 uH
L1
5% SMD
.01uF
C12
47PF
C13
3B
3A
S112
S175
4.7K
R4
R5
R9
+5V
-5V
S74
S39
F74
F04
LS04
4.7K
R33
R7
BLANK
(SHT2) <AD0:AD7>
(SHT2) <A0:A12>
(SHT2) VTIR
(SHT2) BREQ
(SHT2) RD
(SHT2) WR
PVTC (C-3)
Pin 36 - NC
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A12
A11
A10
HSYNC
VSYNC
CURSOR
3H
3J
2H
LS374
LS157
LS367
4016
4X8
JP1
1E
1D
1H
1G
1F
1C
1B
1A
2E
2D
2C
2B
2A
4G
4F
4E
4D
4C
4B
4A
3G
3F
3E
3D
3C
3B
3A
2G
2F
2E
2D
2C
2B
2A
1G
1F
1E
1D
1C
1B
1A


7
6
5
4
3
+5V
4.7K R29
R28 4.7K
Same as
S112
S175
S37
S08
S194
F74
LS04
LS86
LS374
LS157
2732A-20ns
2K X 8
4016
4K X 8
4016
SGA
BLANK
ULINE
BLINK
REVOUT
ULINE
BLAOUT
DIM
CHAR 5
CHAR 4
CHAR 3
CHAR 2
CHAR 1
CHAR 0
CCLK
CURSOR
CNTRL 3
REV
FONT
RAM BUF
RAMS0
RAMS1
MBCOUT
A15
A14
A13
EAROM
KEYBRD
SIO
PVTC
ABREQ
VTIA
BREQ
VSYNC
HSYNC
CURSOR
Pin 36 - NC
Pin 1 - NC
3x4.7K
SIP 1
JP1
R1
470Ω
R30
R31
R33
R9
R7
R5
R4
40 Pin
4E
3A
3B
3E
3F
3H
2H
1E
1D
1C
1H
1G
1F
3G
3J
4H
4G
4D
5A
5B
5C
5D
6A
6B
6C
6D
6E
6F
6G
7A
7B
7C
7D
7E
8A
8B
8C
8D
8E
8F
8G
8H
RA12
RA13
MBC
PC
UNLESS O
DIMENSION
TOLERANC
FRACTIONS
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION


DWG. NO. 96-018-01
REV. F4
REVISIONS
SEE SHEET 2 OF 2
WYSE TECHNOLOGY
LOGIC BOARD, WY500/75
GATE ARRAY VERSION
96-018-01
F4
PARTS LIST
APPLICATION
DO NOT SCALE DRAWING
VIDEO OUT (J4-1)
VIDEO GND (J4-2)
DIM OUT (J4-3)
EXT VIDEO (J1-18)
EXT DIM (J1-25)
HSYNC OUT (J1-14)
VSYNC OUT (J1-24)
VSYNC OUT (J4-5)
HSYNC OUT (J4-4)
DOT CLOCK (J1-9)


1. MOUNT LED NEAR PCB EDGE
2. LS 157 = COMMON
3. ALL JUMPERS (JP) .1" SPACING.
TRACE ON SOLDER SIDE.
4. ALL IC'S EXCEPT U9, U10, U17, U30, U33, U37, U41, U43 AND U48 HAVE INDIVIDUAL 0.1uF BYPASS CAPACITORS.
J1 MODEM PORT 25 PIN DB SOCKET
J4 PRINTER PORT 25 PIN DB SOCKET
JP6
JP5
JP4
JP3
JP8
NOTE :
47uF @ 25V (4 PLCS) CBULK
C21, C57, C59 0.22u/50V
C66 0.01u/50V


7
6
5
4
NOTE :
[1] 47.uF @ 25V (4 PLCS) CBULK
[2] C21, C57, C59 0.22u/50V
C66 0.01u/50V
GND
-12V
-5V
APPLICATION



DWG. NO.	SH	REV
96-018-01	2	F4 (C)

REVISIONS

ZONE	REV.	DESCRIPTION	DATE	APPROVED
A6 SHT 2	C2	CHANGED C21, C57, C59, C66 PER ECN # 447	5/16/1985	
	D	CORRECTION LEVEL PER ECN # 563		
	E	BOM CHANGES PER ECN # 566		
	F	BOM CHANGES PER ECN # 567		
	F1	ADDED REWORK INSTRUCTION PER ECN # 601		
	F2	CHANGED C11, C13, C14 PER ECN # 667		
	F3	CHANGED THE MATERIAL OF D CONN. PER ECN # 693		
	F4	BOM CHANGES PER ECN # 712	5/15/1985	
	F4	SEE ECN # 713 A	7/29/1985	
	F4 (C)	TRANSFER CHANGES (SHT 2 FROM MYLAR TO VELLUM)	12/11/1985	

QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE
FRACTIONS DECIMALS ANGLES
.XX ±
.XXX ±

CONTRACT NO

APPROVALS	DATE
	5/11/83
	12-10-85

MATERIAL

FINISH

ISSUED

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

WYSE TECHNOLOGY

LOGIC BOARD, WY50/55
GATE ARRAY VERSION

SIZE D | FSCM NO. | DWG. NO. 96-018-01 | REV. F4 (C)

SCALE | SHEET 1 OF 2

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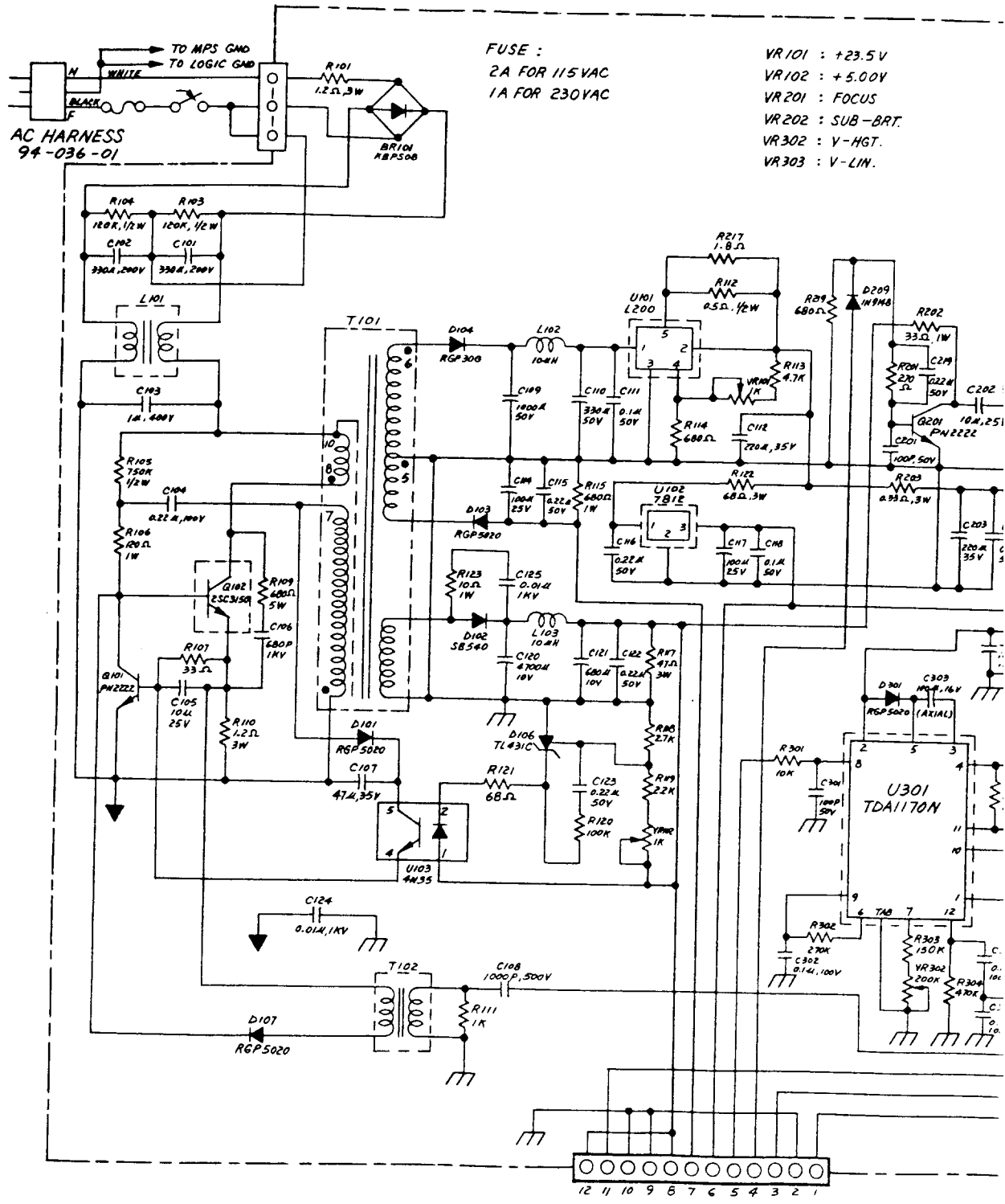
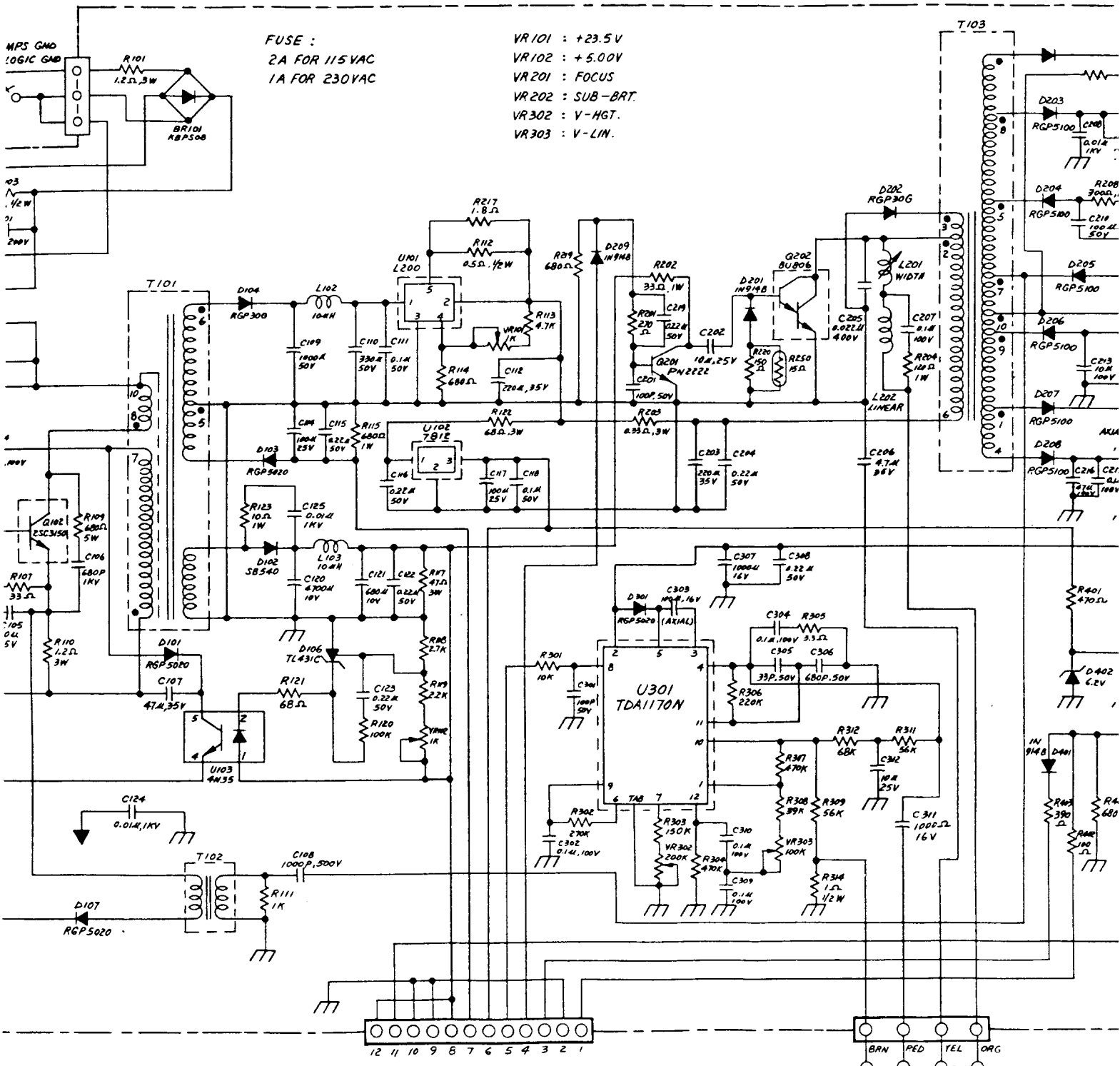


1. VIDEO	WHITE	7. -12V	GREY
2. GND	BLACK	8. +5V	RED
3. DIM	ORANGE	9. GND	BLACK
4. H-SYNC	YELLOW	10. GND	BLACK
5. V-SYNC	GREEN	11. -23V	PURPLE
6. +12V	BLUE	12. +5V	RED

LOGIC HARI
94-034-(


FUSE :
2A FOR 115VAC
1A FOR 230VAC
VR101 : +23.5V
VR102 : +5.00V
VR201 : FOCUS
VR202 : SUB-BRT.
VR302 : V-HGT.
VR303 : V-LIN.
MPS GND
LOGIC GND
R101 1.2Ω,3W
BR101 KBP508
T101
T102
T103
U101 L200
U102 7812
U301 TDA1170N
U103 4N35
Q101 2SC3150
Q201 PN2222
Q202 BU806
D101 RGP5020
D102 SB540
D103 RGP5020
D104 RGP30B
D106 TL431C
D107 RGP5020
D201 1N914B
D202 RGP30G
D203 RGP5100
D204 RGP5100
D205 RGP5100
D206 RGP5100
D207 RGP5100
D208 RGP5100
D209 1N914B
D301 RGP5020
D401 1N914B
D402 6.2V
L101 10μH
L102 10μH
L103 10μH
L201 WIDTH
L202 LINEAR
C106 680P 1KV
C107 47μ,35V
C108 1000P,500V
C109 1000μ 50V
C110 330μ 50V
C111 0.1μ 50V
C112 220μ,35V
C120 4700μ 10V
C121 680μ 10V
C122 0.22μ 50V
C123 0.22μ 50V
C124 0.01μ,1KV
C125 0.01μ 1KV
C201 100P,50V
C202 10μ,25V
C203 220μ 35V
C204 0.22μ 50V
C205 0.022μ 400V
C206 4.7μ 25V
C207 0.1μ 100V
C208 0.01μ 1KV
C209 0.01μ 1KV
C210 100μ 50V
C211 10μ 100V
C212 0.1μ 100V
C213 10μ 100V
C214 0.1μ 100V
C301 100P 50V
C302 0.1μ,100V
C303 10μ,16V
C304 0.1μ,100V
C305 33P,50V
C306 680P,50V
C307 1000μ 16V
C308 0.22μ 50V
C309 0.1μ 100V
C310 0.1μ 100V
C311 1000Ω 16V
C312 10μ 25V
R107 33Ω
R109 680Ω 5W
R110 1.2Ω 3W
R111 1K
R112 0.5Ω,1/2W
R113 4.7K
R114 680Ω
R115 680Ω 1W
R117 47Ω 3W
R120 100K
R121 68Ω
R122 68Ω,3W
R123 10Ω 1W
R201 270Ω
R202 33Ω,1W
R203 0.95Ω,3W
R204 120Ω 1W
R205 150Ω
R206 150Ω
R207 1.8Ω
R208 3000Ω
R209 680Ω
R210 15Ω
R301 10K
R302 270K
R303 150K
R304 470K
R305 3.3Ω
R306 220K
R307 470K
R308 39K
R309 56K
R310 27K
R311 56K
R312 68K
R313 1Ω 1/2W
R314 1Ω 1/2W
R401 470Ω
R402 390Ω
R403 680Ω
R404 100Ω
VR101 1K
VR102 1K
VR201 1K
VR202 1K
VR301 1K
VR302 200K
VR303 100K
1. VIDEO WHITE
2. GND BLACK
3. DIM ORANGE
4. H-SYNC YELLOW
5. V-SYNC GREEN
6. +12V BLUE
7. -12V GREY
8. +5V RED
9. GND BLACK
10. GND BLACK
11. -23V PURPLE
12. +5V RED
LOGIC HARNESS
94-034-01
YOKE HARNESS
940154-01
BRN
RED
YEL
ORG
THIRD ANGLE PR

DWG. NO.	SH	REV
96-019-02	1	Arc1

REVISIONS

ECN	REV	DESCRIPTION	DATE	APPROVED
#916	A	RTC	10-16-85	
#1070	Arc1	REDRAWN FOR CLARITY. NO CHANGES	12-11-85	

PARTS LIST

QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

WY-50+

NEXT ASSY | USED ON

APPLICATION

THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN TOLERANCES

INCHES | METRIC

FRACTIONS ± | DECIMALS ± .XX ± .XXX ±

ANGLES

MATERIAL | FINISH

DO NOT SCALE DRAWING

CONTRACT NO

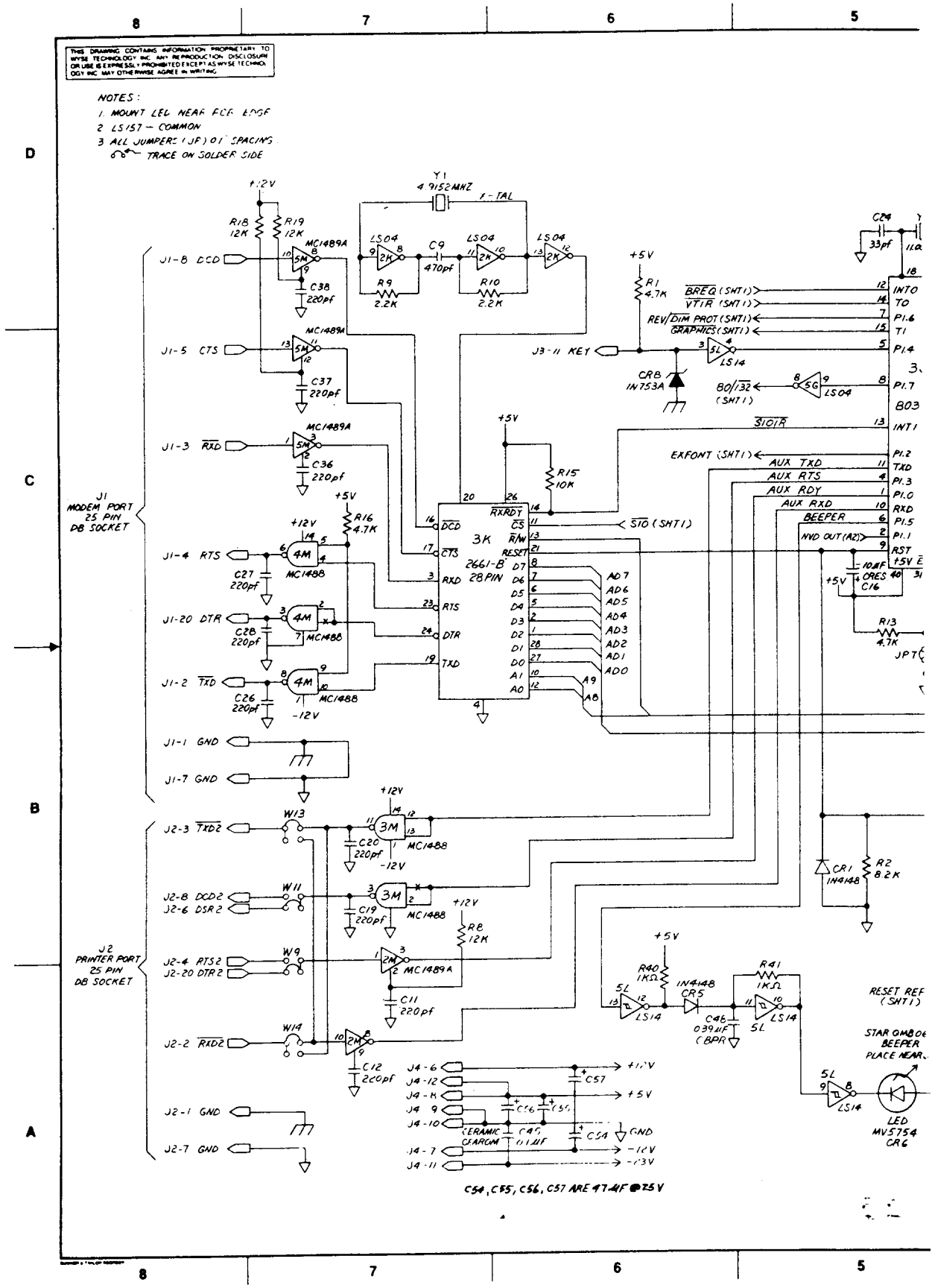
WYSE TECHNOLOGY INCORPORATED

WY-50+ SCHEMATIC

SIZE	FSCM NO	DWG NO	REV
D		96-019-02	Arc1

SCALE | SHEET 1 OF 1

DATE
12-6-85
12-10-85
12-11-85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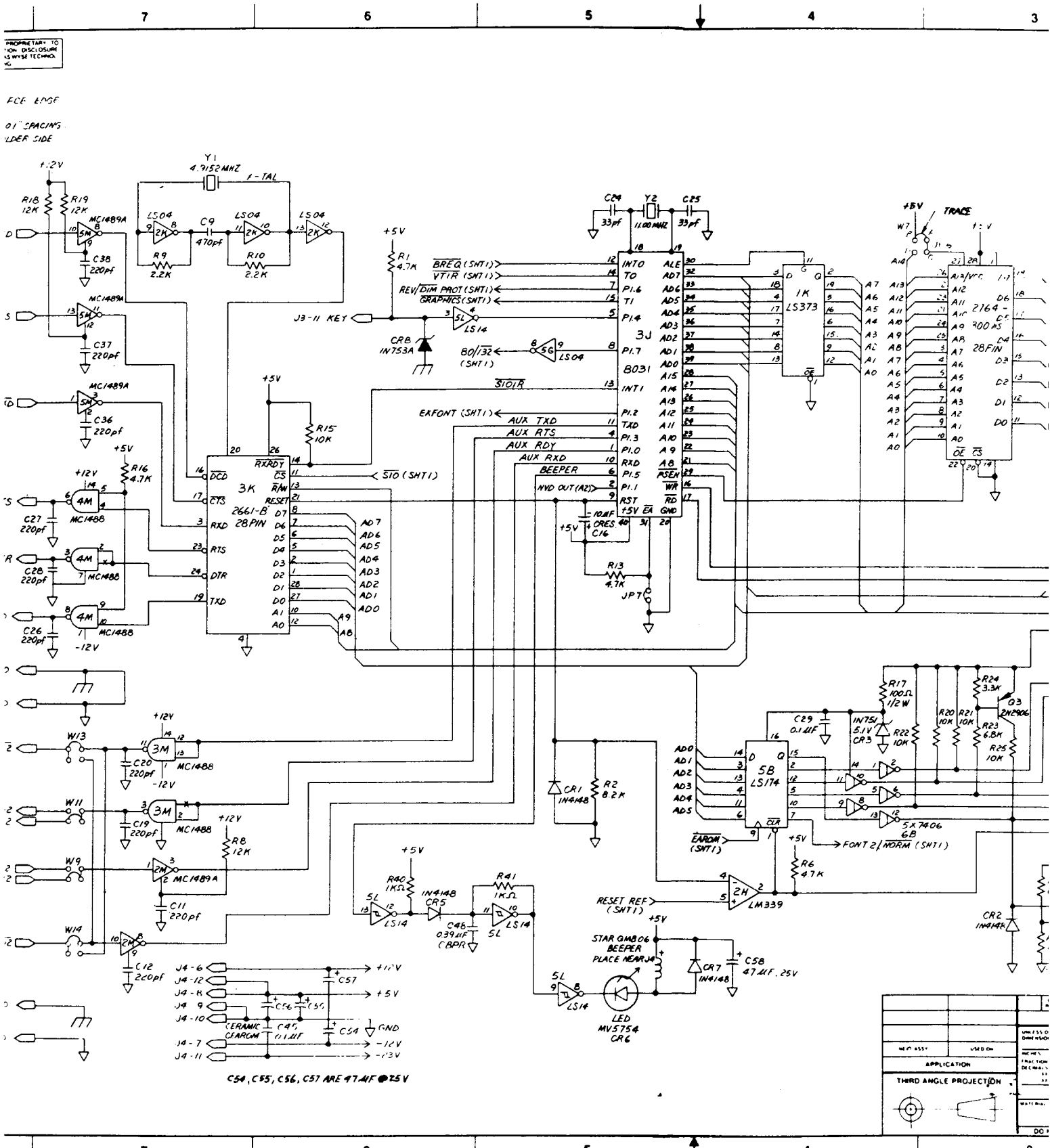
NOTES:
1. MOUNT LED NEAR PCB EDGE
2. LS157 — COMMON
3. ALL JUMPERS (JP) 01 SPACING
TRACE ON SOLDER SIDE
J1 MODEM PORT 25 PIN DB SOCKET
J2 PRINTER PORT 25 PIN DB SOCKET
J1-8 DCD
J1-5 CTS
J1-3 RXD
J1-4 RTS
J1-20 DTR
J1-2 TXD
J1-1 GND
J1-7 GND
J2-3 TXD2
J2-8 DCD2
J2-6 DSR2
J2-4 RTS2
J2-20 DTR2
J2-2 RXD2
J2-1 GND
J2-7 GND
MC1489A
MC1488
2661-B 28 PIN
3K
Y1 4.9152MHZ
LS04
LS14
LS157
IN4148
IN753A
J3-11 KEY
BREQ (SHT1)
VTIR (SHT1)
REV/DIM PROT (SHT1)
GRAPHICS (SHT1)
80/132 (SHT1)
EXFONT (SHT1)
AUX TXD
AUX RTS
AUX RDY
AUX RXD
BEEPER
NVD OUT (A2)
STO (SHT1)
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A9
A8
RESET REF (SHT1)
STAR GMB06 BEEPER PLACE NEAR
LED MV5754 CR6
C54, C55, C56, C57 ARE 47 uF @ 25 V


PROPRIETARY TO
DISCLOSURE
WYSE TECHNO
EDGE EDGE
01" SPACING
LDER SIDE
+12V
Y1
4.9152 MHZ
XTAL
R18
12K
R19
12K
MC1489A
LS04
C9
470pf
R9
2.2K
R10
2.2K
C38
220pf
C37
220pf
C36
220pf
C27
220pf
C28
220pf
C26
220pf
MC1488
-12V
+5V
R16
4.7K
R15
10K
3K
2661-B
28 PIN
RXRDY
DCD
CTS
RXD
RTS
DTR
TXD
CS
R/W
RESET
D7
D6
D5
D4
D3
D2
D1
D0
A1
A0
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A9
A8
S10 (SHT1)
C24
33pf
Y2
11.000 MHZ
C25
33pf
R1
4.7K
BREQ (SHT1)
VTIR (SHT1)
REV/DIM PROT (SHT1)
GRAPHICS (SHT1)
J3-11 KEY
LS14
CR8
IN753A
80/132
(SHT1)
LS04
S10/R
EXFONT (SHT1)
AUX TXD
AUX RTS
AUX RDY
AUX RXD
BEEPER
NVD OUT (A2)
3J
8031
INT0
TO
P1.6
TI
P1.4
P1.7
INT1
P1.2
TXD
P1.3
P1.0
RXD
P1.5
P1.1
RST
ALE
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A15
A14
A13
A12
A11
A10
A9
A8
PSEN
WR
RD
GND
EA
+5V
10 uF
CRES
C16
R13
4.7K
JP7
1K
LS373
TRACE
2164-
200 NS
28 PIN
D7
D6
D5
D4
D3
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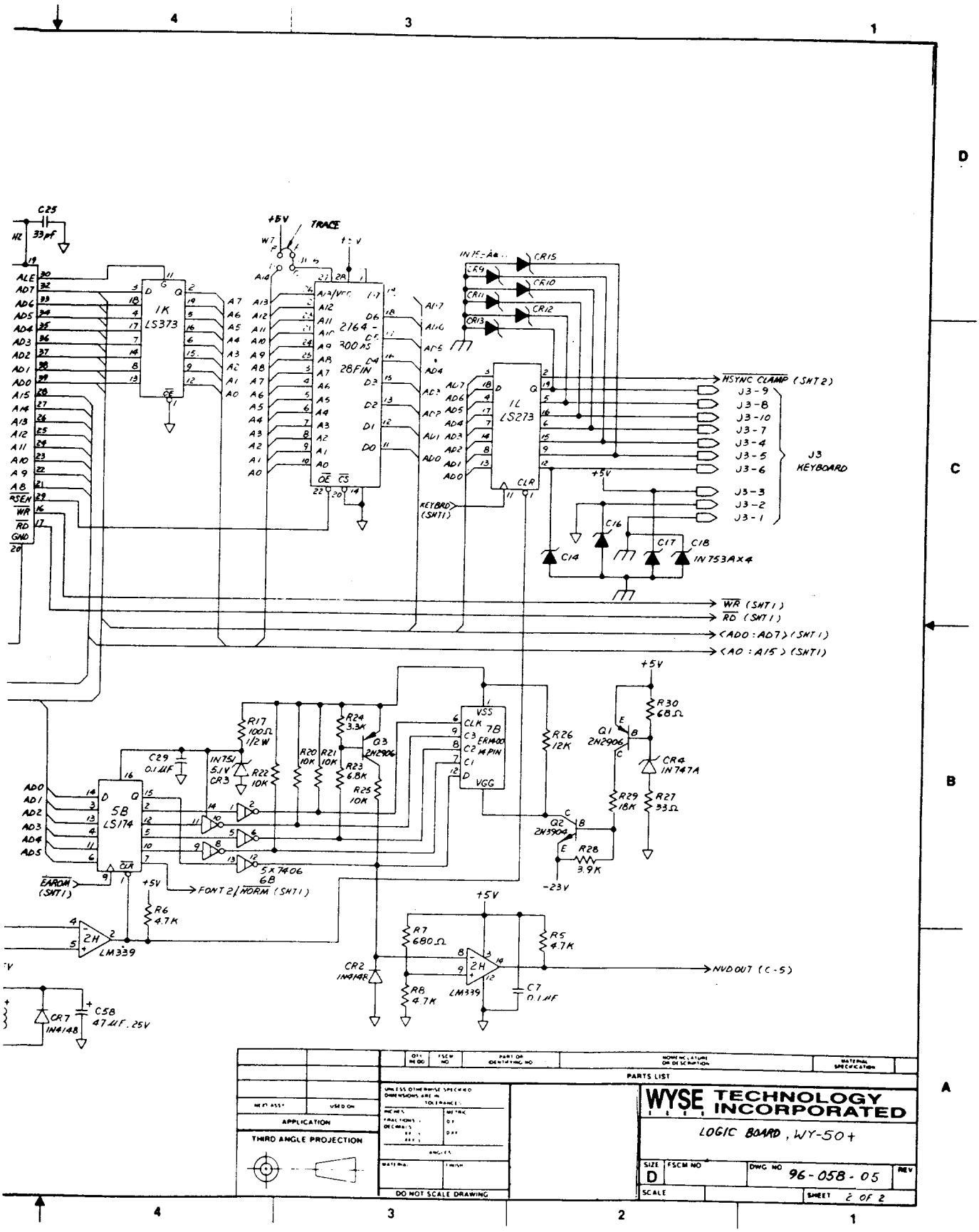
D0
A13
A12
A11
A10
A9
A8
A7
A6
A5
A4
A3
A2
A1
A0
R17
100Ω
1/2 W
R24
3.3K
Q3
2N2906
R20
10K
R21
10K
R23
6.8K
R25
10K
C29
0.1 uF
IN751
5.1V
CR3
R22
10K
5B
LS174
5 X 7406
6B
EAROM
(SHT1)
FONT 2/NORM (SHT1)
R6
4.7K
CR1
IN4148
R2
8.2K
W13
W11
W9
W14
C20
220pf
C19
220pf
C11
220pf
C12
220pf
R8
12K
MC1489A
R40
1KΩ
CR5
IN4148
R41
1KΩ
C48
0.39 uF
CBPR
LS14
RESET REF
(SHT1)
LM339
STAR GMB06
BEEPER
PLACE NEAR J4
LED
MV5754
CR6
CR7
IN4148
C58
47 uF, 25V
CR2
IN4148
J4-6
J4-12
J4-8
J4-9
J4-10
J4-7
J4-11
+12V
+5V
GND
-12V
-13V
CERAMIC
CEARCAP
C47
0.1 uF
C57
C56
C55
C54
C54, C55, C56, C57 ARE 47 uF @ 25V
APPLICATION
THIRD ANGLE PROJECTION



PARTS LIST

QTY PER	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES. TOLERANCE: FRACTIONS ± DECIMALS .X ± .XX ± .XXX ± ANGLES ±

NEXT ASSY | USED ON

APPLICATION

THIRD ANGLE PROJECTION

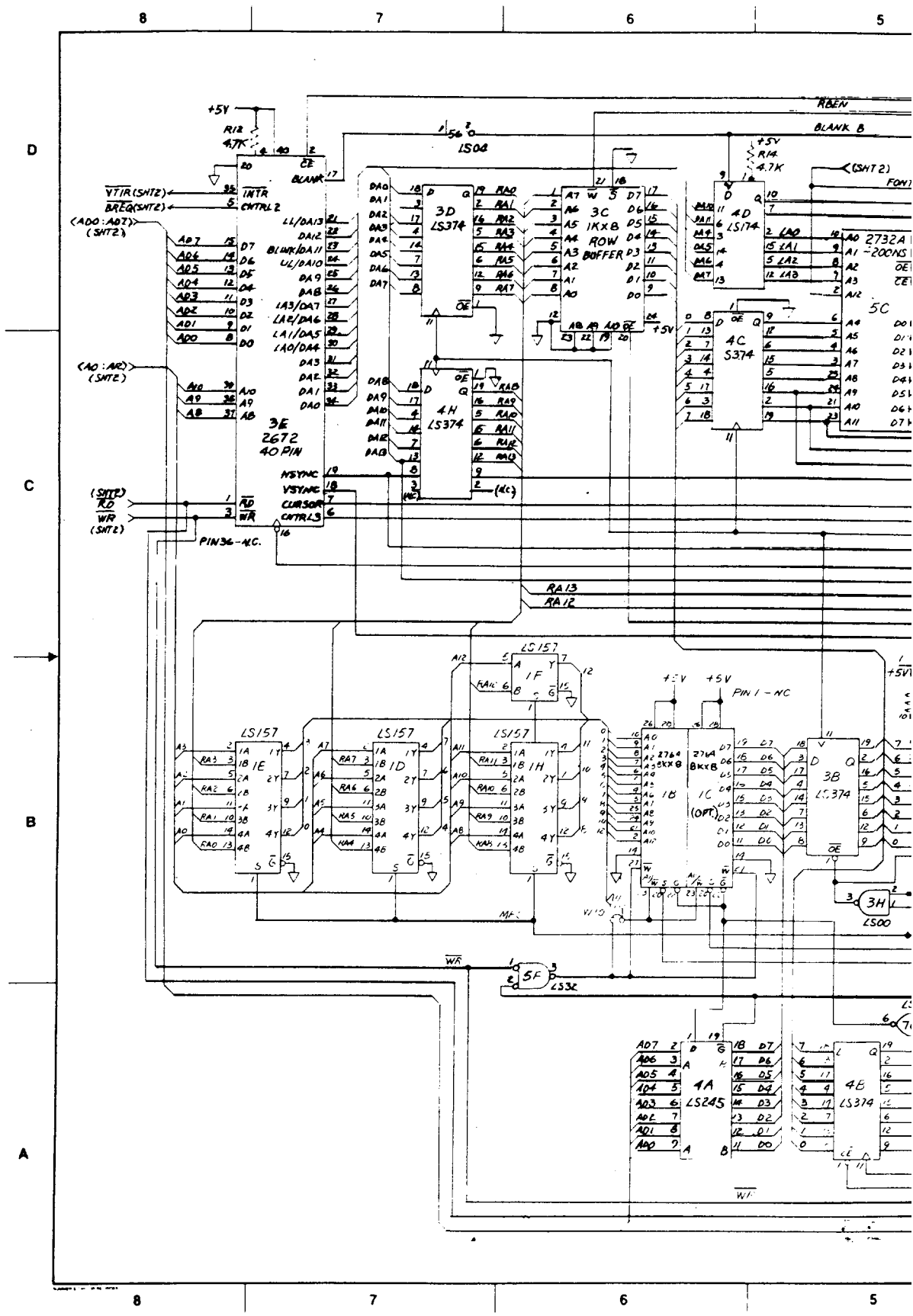
DO NOT SCALE DRAWING

WYSE TECHNOLOGY INCORPORATED

LOGIC BOARD, WY-50+

SIZE	FSCM NO	DWG NO	REV
D		96-058-05	

SCALE | SHEET 2 OF 2


8
7
6
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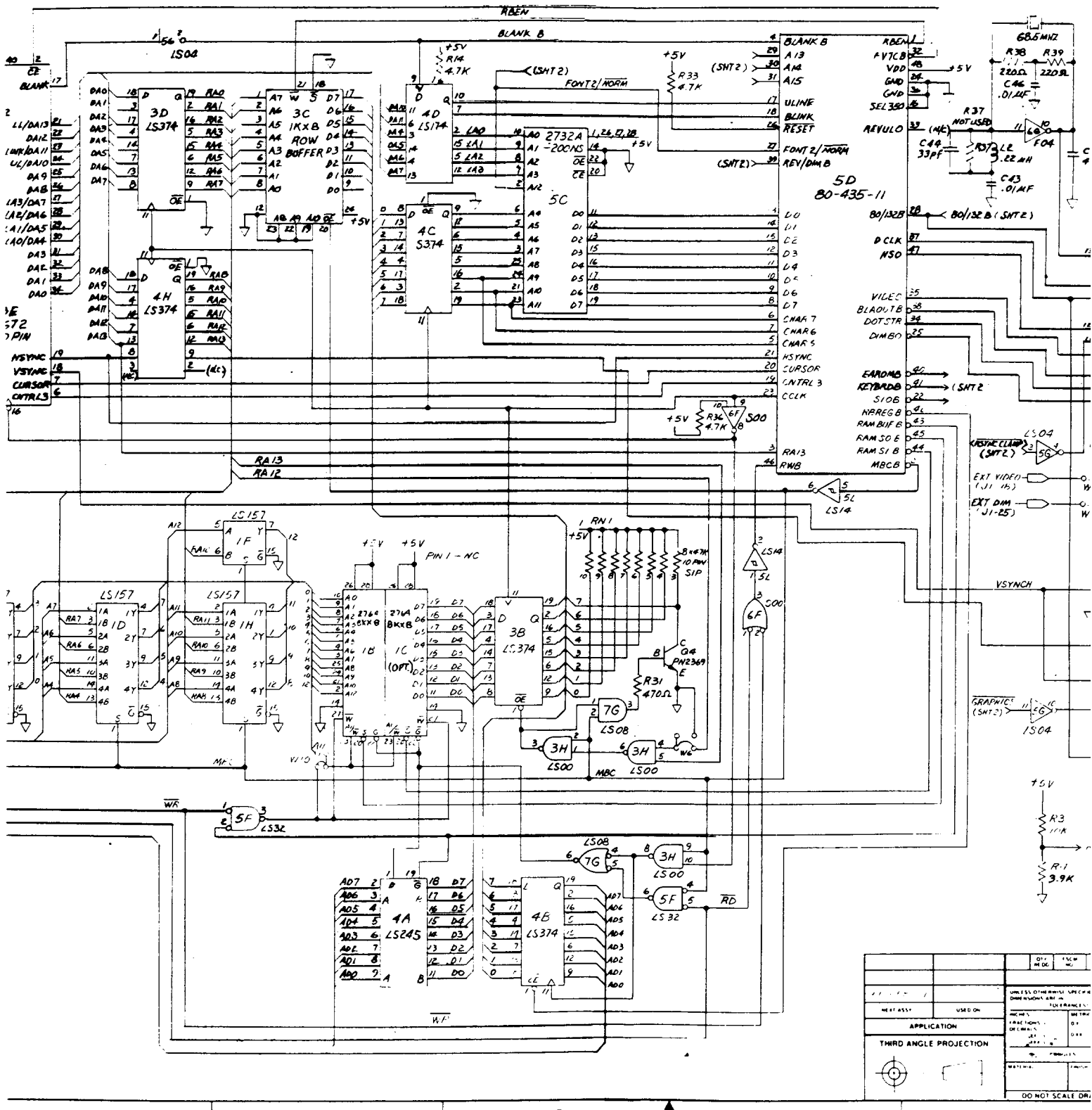
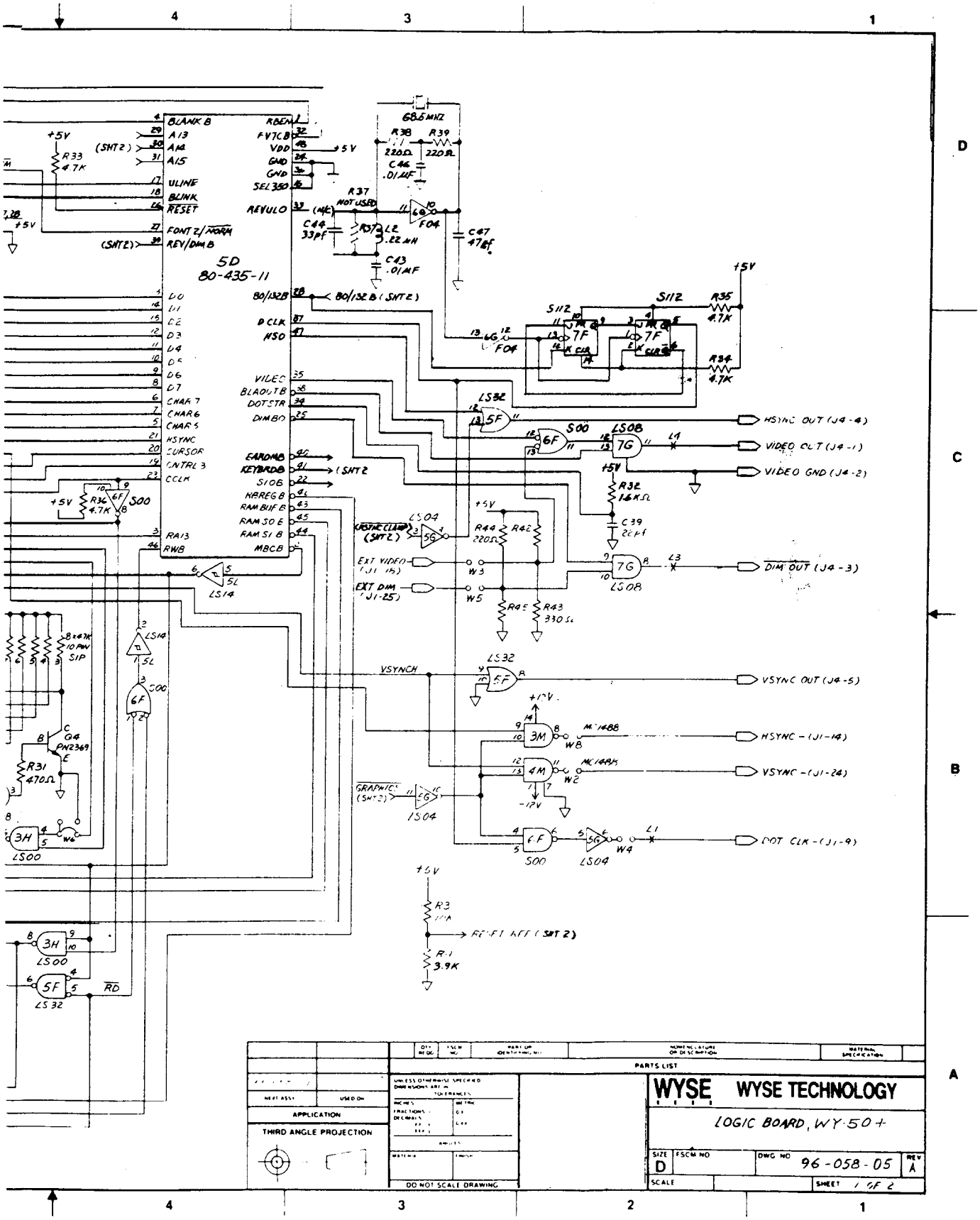
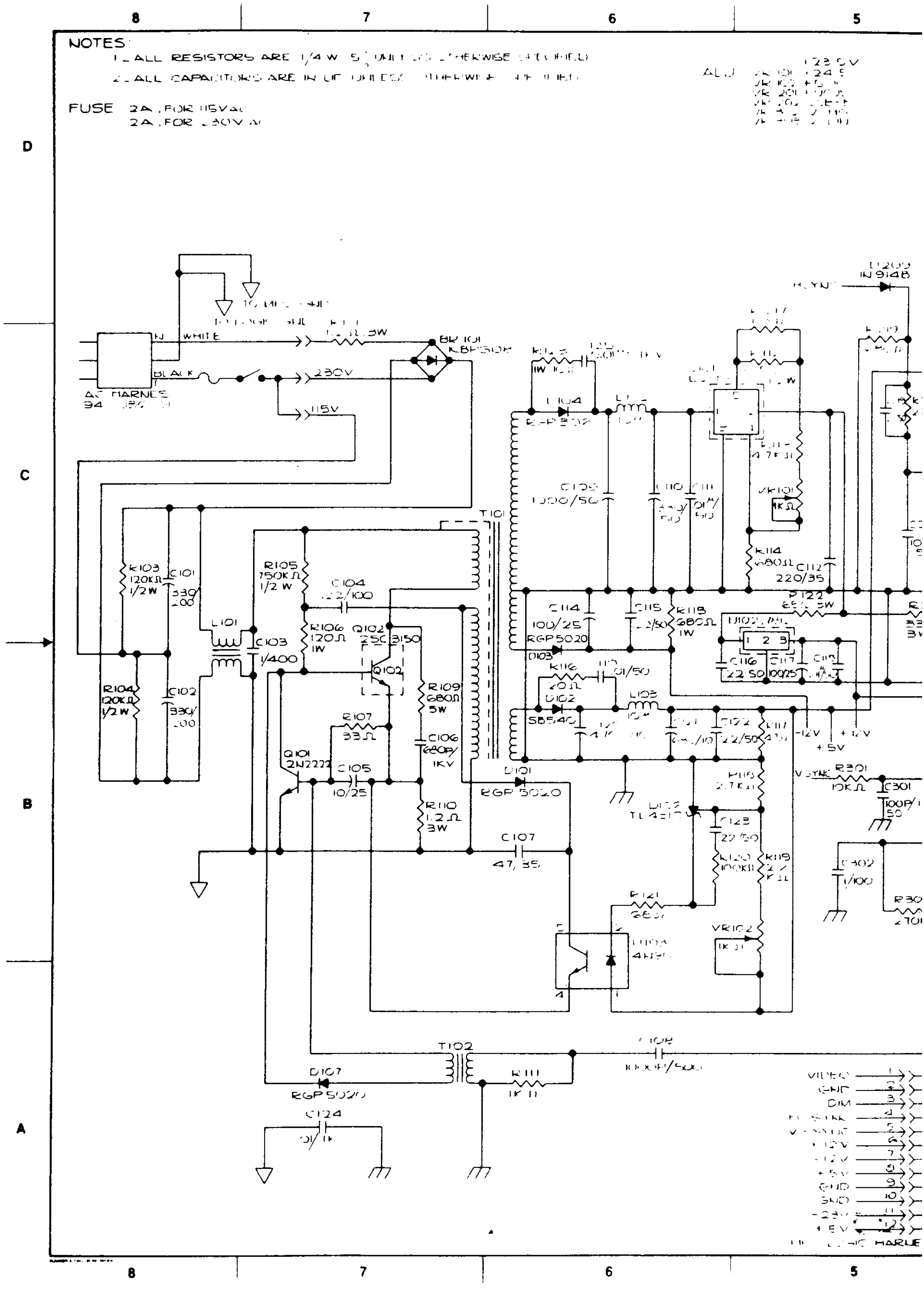
D
C
B
A
+5V
R12
4.7K
LS08
RBEN
BLANK B
R14
4.7K
(SHT2)
VTIR(SHT2)
BREQ(SHT2)
(AD0:AD7)
(SHT2)
(A0:A8)
(SHT2)
(SHT2)
RD
WR
(SHT2)
INTR
CNTRL2
BLANK
LL/DA13
DA12
BLINK/DA11
UL/DA10
DA9
DA8
LA3/DA7
LA2/DA6
LA1/DA5
LA0/DA4
DA3
DA2
DA1
DA0
HSYNC
VSYNC
CURSOR
CNTRL3
RD
WR
PIN36-NC.
3E
2672
40 PIN
3D
LS374
4H
LS374
3C
1KX8
ROW
BUFFER
4D
LS174
4C
S374
5C
2732A
-200NS
OE
CE
RA13
RA12
LS157
1F
1E
1D
1H
1B
1C
(OPT.)
2764
8KX8
27HA
PIN 1 - NC
3B
LS374
3H
LS00
5F
LS32
WR
4A
LS245
4B
LS374
WI


RBEN
BLANK B
LS04
3D LS374
3C 1KX8 ROW BUFFER
4D LS174
4C S374
2732A -200NS
5C
5D 80-435-11
4H LS374
FONT2/NORM
REV/DMB
ULINE
BLINK
RESET
RA13
RA12
RWB
MBCB
LS157
1F
1D
1H
1C (OPT)
2764 8KX8
3B LS374
RN1
8 4.7K 10 PIN SIP
R31 470Ω
Q4 PN2369
LS08
LS00
LS32
4A LS245
4B LS374
WR
RD
MBC
VSYNCH
68.6MHZ
R38 220Ω
R39 220Ω
C46 .01μF
C44 33pF
R37 3.22 μH
C43 .01μF
F04
LS14
EXT VIDEO (J1-15)
EXT DIM (J1-25)
GRAPHICS (SHT 2)
R3 1.1K
R1 3.9K
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING


5D
80-435-11
68.5 MHZ
R38 220Ω
R39 220Ω
C46 .01μF
R37 NOT USED
C44 33pF
L2 .22μH
C43 .01μF
C47 47pF
R33 4.7K
R35 4.7K
R34 4.7K
R32 1.6KΩ
C39 22pf
R44 220Ω
R42
R45
R43 330Ω
R31 470Ω
Q4 PN2369
8x4.7K 10 PIN SIP
R3 1.1K
R1 3.9K
BLANK B
A13
A14
A15
ULINE
BLINK
RESET
FONT2/NORM
REV/DIMB
D0
D1
D2
D3
D4
D5
D6
D7
CHAR7
CHAR6
CHAR5
HSYNC
CURSOR
CNTRL3
CCLK
RA13
RWB
RBEN
FVTCB
VDD
GND
GND
SEL350
REVULO
80/132B
DCLK
MSO
VILEC
BLAOUTB
DOTSTR
DIMBO
CAROMB
KEYBRDB
SIOB
NAREGB
RAMBUFB
RAMSOB
RAMSIB
MBCB
(SHT2)
80/132B (SHT2)
HSYNC OUT (J4-4)
VIDEO OUT (J4-1)
VIDEO GND (J4-2)
DIM OUT (J4-3)
VSYNC OUT (J4-5)
HSYNC - (J1-14)
VSYNC - (J1-24)
DOT CLK - (J1-9)
EXT VIDEO (J1-15)
EXT DIM (J1-25)
VSYNCH
GRAPHICS (SHT2)
RD
+5V
+12V
-12V
LS00
LS04
LS08
LS14
LS32
S00
S04
S08
S12
WYSE TECHNOLOGY
LOGIC BOARD, WY-50+
PARTS LIST
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
SIZE D
FSCM NO
DWG NO 96-058-05
REV A
SCALE
SHEET 1 OF 2


8
7
6
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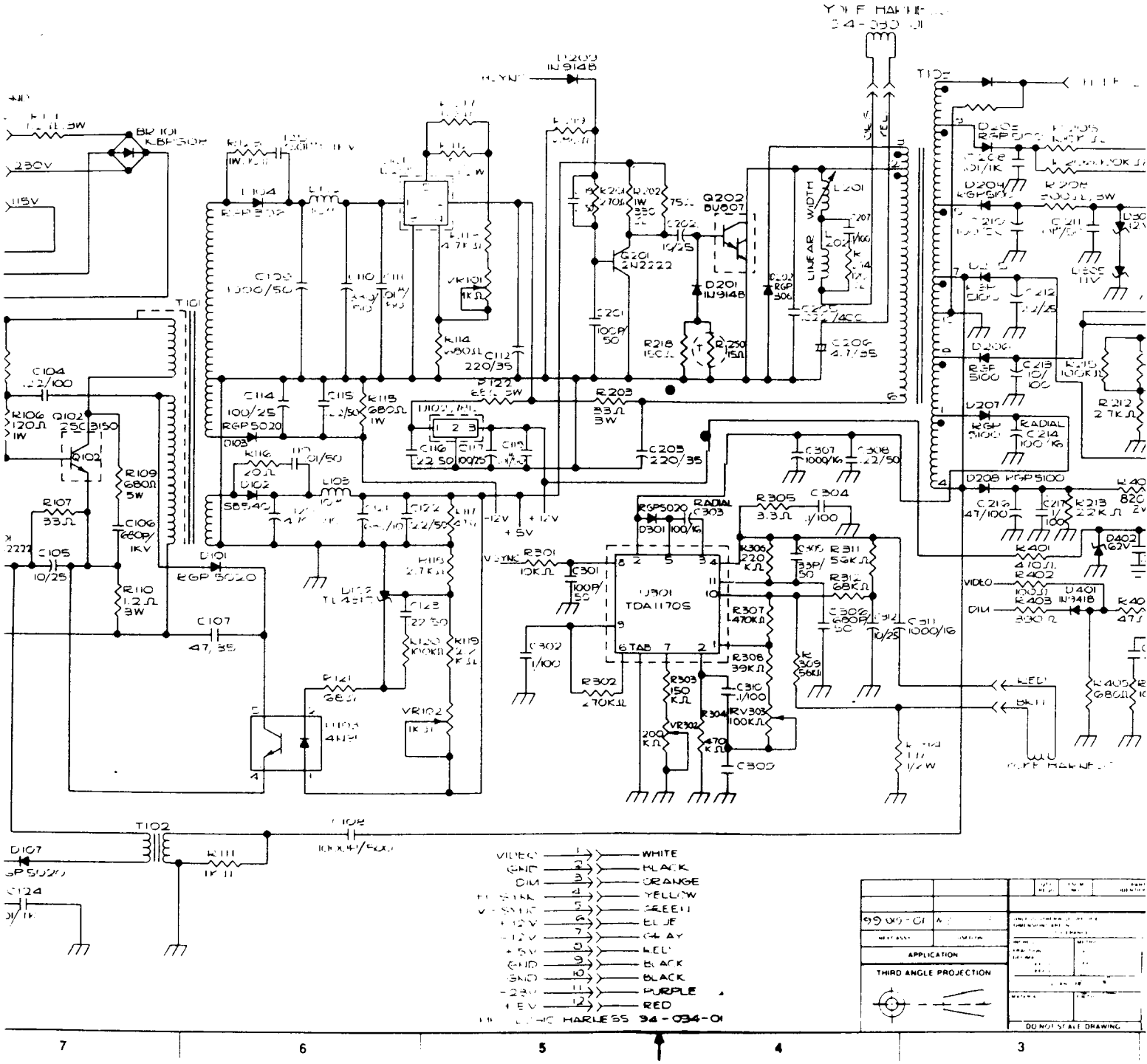
D
C
B
A
NOTES:
1. ALL RESISTORS ARE 1/4 W 5% UNLESS OTHERWISE SPECIFIED
2. ALL CAPACITORS ARE IN UF UNLESS OTHERWISE SPECIFIED
FUSE 2A, FOR 115VAC
2A, FOR 230VAC
ADJ
+23.5V
VR101 +24.5
D209
IN9148
WHITE
BLACK
AC HARNESS
230V
115V
BR101
KBP308
R103
120KΩ
1/2W
C101
330/200
R104
120KΩ
1/2W
C102
330/200
L101
C103
1/400
R105
750KΩ
1/2 W
C104
.22/100
R106
120Ω
1W
Q102
2SC3150
R109
680Ω
5W
R107
33Ω
C106
680P/
1KV
Q101
2N2222
C105
10/25
R110
1.2Ω
3W
T101
D101
RGP5020
C107
47/35
D104
C109
1000/50
C110
C111
VR101
1KΩ
R114
680Ω
C112
220/35
R122
3W
C114
100/25
C115
R118
680Ω
1W
RGP5020
D103
C116
22/50
C117
100/25
C118
R116
20Ω
D102
SB540
L103
C122
22/50
-12V
+12V
+5V
V SYNC
R301
10KΩ
C301
100P/
50
C123
22/50
R120
100KΩ
R119
R121
VR102
1KΩ
4N35
C302
1/100
T102
C108
1000P/500
D107
RGP5020
R111
1KΩ
C124
VIDEO
GND
DIM
GND
+5V
HARNE


7
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BR101
KBP510R
230V
115V
T101
T102
Q102
2SC3150
Q202
BU807
Q201
2N2222
D201
IN9148
D209
IN9148
D101
RGP5020
D102
SB540
D103
D107
RGP5020
U201
TDA1170S
U202
TL431C
VR101
1KΩ
VR102
1KΩ
VR301
100KΩ
VR302
200KΩ
VR303
100KΩ
LINEAR WIDTH
R218
150Ω
R219
100KΩ
R220
5000Ω 5W
R203
33Ω 3W
R204
270Ω 1W
R205
330Ω 1W
R301
10KΩ
R302
270KΩ
R303
150KΩ
R304
470KΩ
R305
3.3Ω
R306
220KΩ
R307
470KΩ
R308
39KΩ
R309
56KΩ
R310
68KΩ
R311
56KΩ
R312
68KΩ
R401
470Ω
R402
100Ω
R403
330Ω
R404
47Ω
R405
680Ω
R406
820Ω
R407
33Ω
R108
1.2Ω 3W
R109
680Ω 5W
R110
1.2Ω 3W
R111
1K Ω
R112
1K Ω 1/2W
R106
120Ω 1W
C101
0.01/50
C102
0.01/50
C103
1000/50
C104
2.2/100
C105
10/25
C106
660P/1KV
C107
47/35
C108
10000P/500V
C109
0.01/50
C110
0.01/50
C111
0.01/50
C112
220/35
C113
0.01/50
C114
100/25
C115
2.2/50
C116
22/50
C117
100/25
C118
680Ω 1W
C119
0.01/50
C120
22/50
C121
4.7/50
C122
22/50
C123
22/50
C124
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C311
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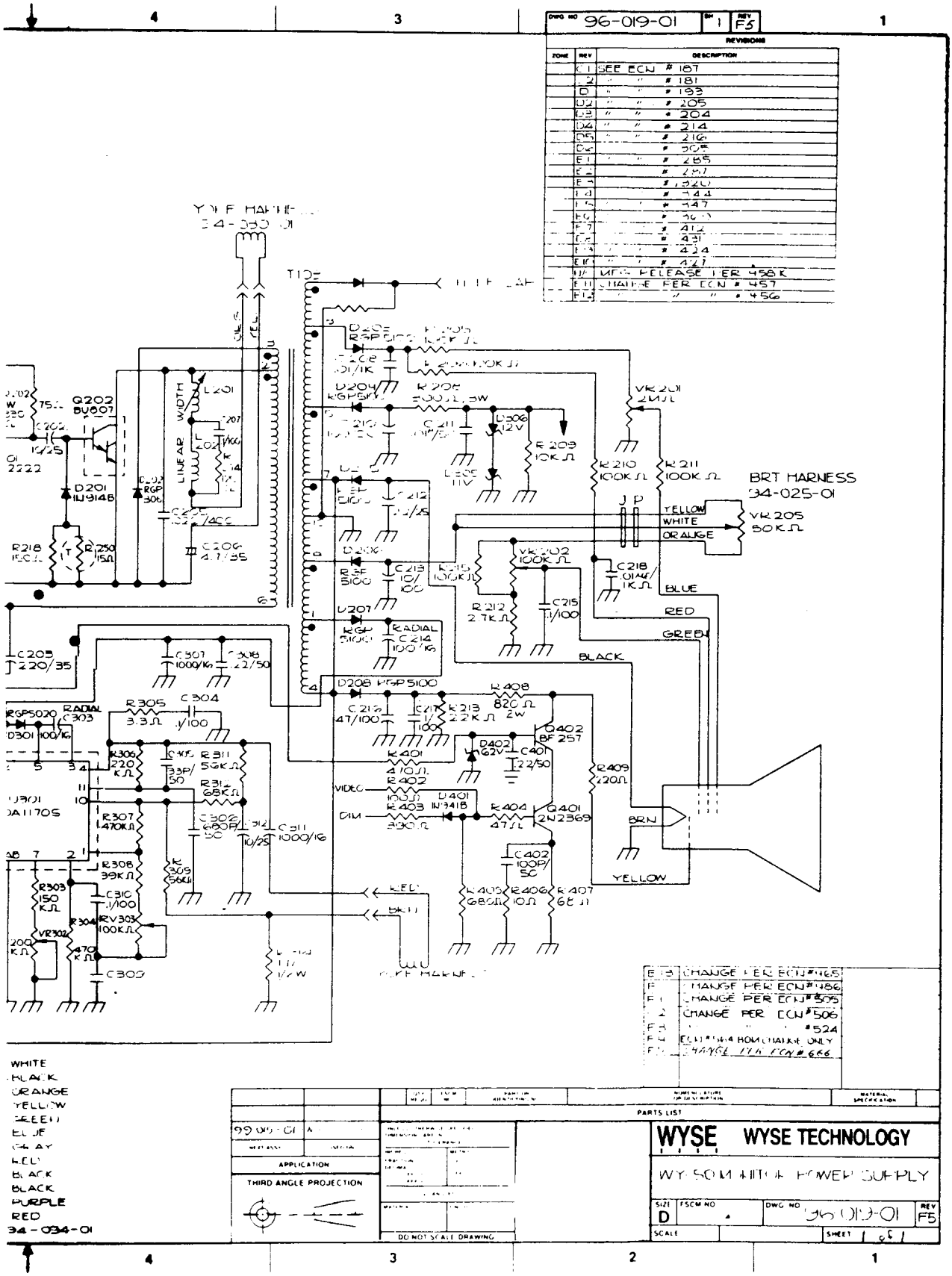
C312
0.01/50
D201
IN9148
D202
RGP306
D203
RGP306
D204
RGP5100
D205
RGP5100
D206
RGP5100
D207
RGP5100
D208
RGP5100
D209
IN9148
D301
RGP5020
D401
IN9418
D402
6.2V
VIDEO
GND
DIM
HSYNC
VSYNC
+12V
-12V
+5V
GND
GND
-23V
+EHT
WHITE
BLACK
ORANGE
YELLOW
GREEN
BLUE
GRAY
RED
BLACK
BLACK
PURPLE
RED
99-09-01
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING


DWG NO 96-019-01
SH 1
REV F5
REVISIONS
ZONE REV DESCRIPTION
C1 SEE ECN # 187
C2 " " # 181
D " " # 193
D2 " " # 205
D3 " " # 204
D4 " " # 214
D5 " " # 216
D6 " " # 208
E1 " " # 285
E2 " " # 291
E3 " " # 1926
E4 " " # 344
E5 " " # 347
E6 " " # 360
F7 " " # 412
F8 " " # 431
F9 " " # 424
F10 " " # 421
F11 MFG RELEASE PER ECN # 458 R
F12 CHANGE PER ECN # 457
F13 " " " # 456
BRT HARNESS
34-025-01
YELLOW
WHITE
ORANGE
BLUE
RED
GREEN
BLACK
BRN
YELLOW
VR205
50K Ω
Q202
BU807
Q402
BF 257
Q401
2N2369
D201
1N914B
D401
1N941B
D402
6.2V
D306
12V
D208 MGP5100
R408
820 Ω
R409
220Ω
R401
470Ω
R402
100Ω
R403
390Ω
R404
47Ω
R405
680Ω
R406
10Ω
R407
68Ω
R218
150Ω
R250
150Ω
R210
100K Ω
R211
100K Ω
R209
10K Ω
R212
2.7K Ω
R213
2.2K Ω 2W
R305
3.3Ω
R306
220 KΩ
R307
470K Ω
R308
39K Ω
R309
56KΩ
R311
56K Ω
R312
68K Ω
R303
150 KΩ
R304
200 KΩ
RV303
100K Ω
VR302
470 KΩ
C205
220/35
C206
4.7/35
C207
.022/400
C208
.01/1K
C209
.01/1K
C210
.01/1K
C211
.1/50
C212
.1/25
C213
10/100
C214
100/16
C215
.1/100
C216
47/100
C217
1/100
C218
.01Mf/1K Ω
C219
.1/100
C220
.1/100
C221
.1/100
C222
.1/100
C301
1000/16
C302
.22/50
C303
100/16
C304
.1/100
C305
33P/50
C306
680P/50
C307
.1/100
C308
.1/100
C309
10/25
C310
.1/100
C311
1000/16
C312
10/25
C401
22/50
C402
100P/50
C403
.1/100
VIDEO
DIM
LINEAR
WIDTH
VERT
HOR
YOKE
TIDE
WHITE
BLACK
ORANGE
YELLOW
GREEN
BLUE
GRAY
RED
BLACK
BLACK
PURPLE
RED
34-034-01
E13 CHANGE PER ECN #465
F CHANGE PER ECN #486
F1 CHANGE PER ECN #505
2 CHANGE PER ECN #506
F3 " " #524
F4 ECN #514 NOM CHANGE ONLY
F5 CHANGE PER ECN #666
PARTS LIST
99-019-01
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
WYSE WYSE TECHNOLOGY
WY-50 MULTI POWER SUPPLY
SIZE D
FSCM NO
DWG NO 96-019-01
REV F5
SCALE
SHEET 1 of 1

8 7 6 5

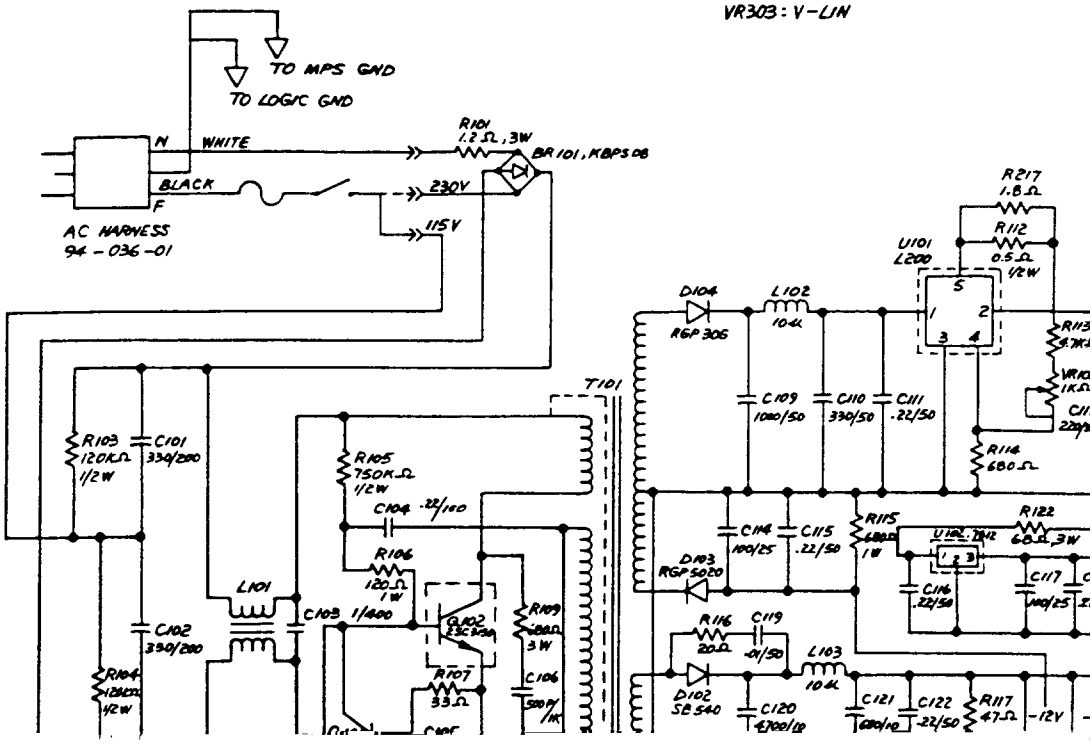
NOTES :
1. ALL RESISTORS ARE 1/4 W, 5% UNLESS OTHERWISE SPECIFIED.
2. ALL CAPACITORS ARE IN UF UNLESS OTHERWISE SPECIFIED.

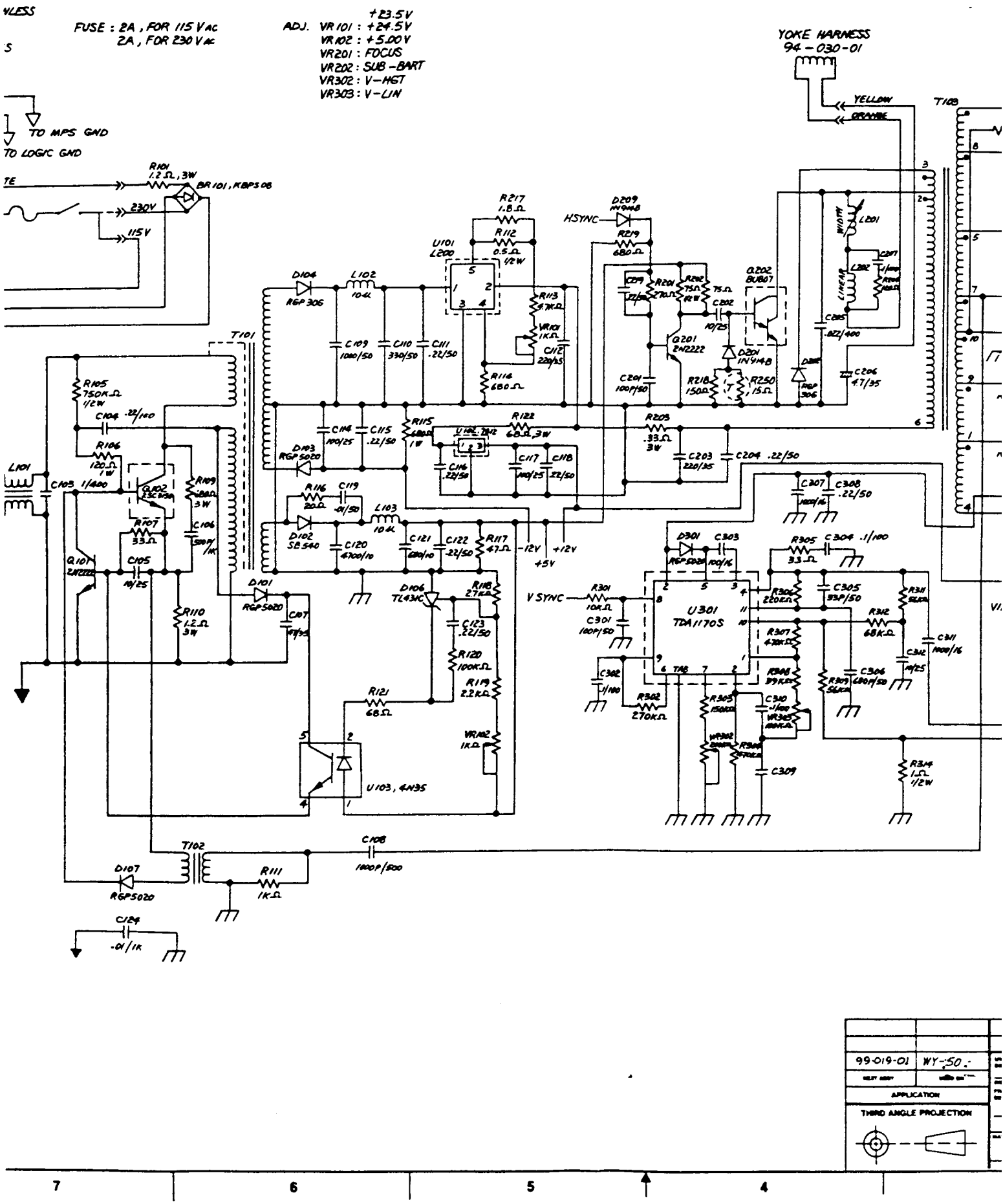
FUSE : 2A , FOR 115 V ac
2A , FOR 230 V ac

ADJ. +23.5V
VR101 : +24.5V
VR102 : +5.00V
VR201 : FOCUS
VR202 : SUB-BART
VR302 : V-HGT
VR303 : V-LIN

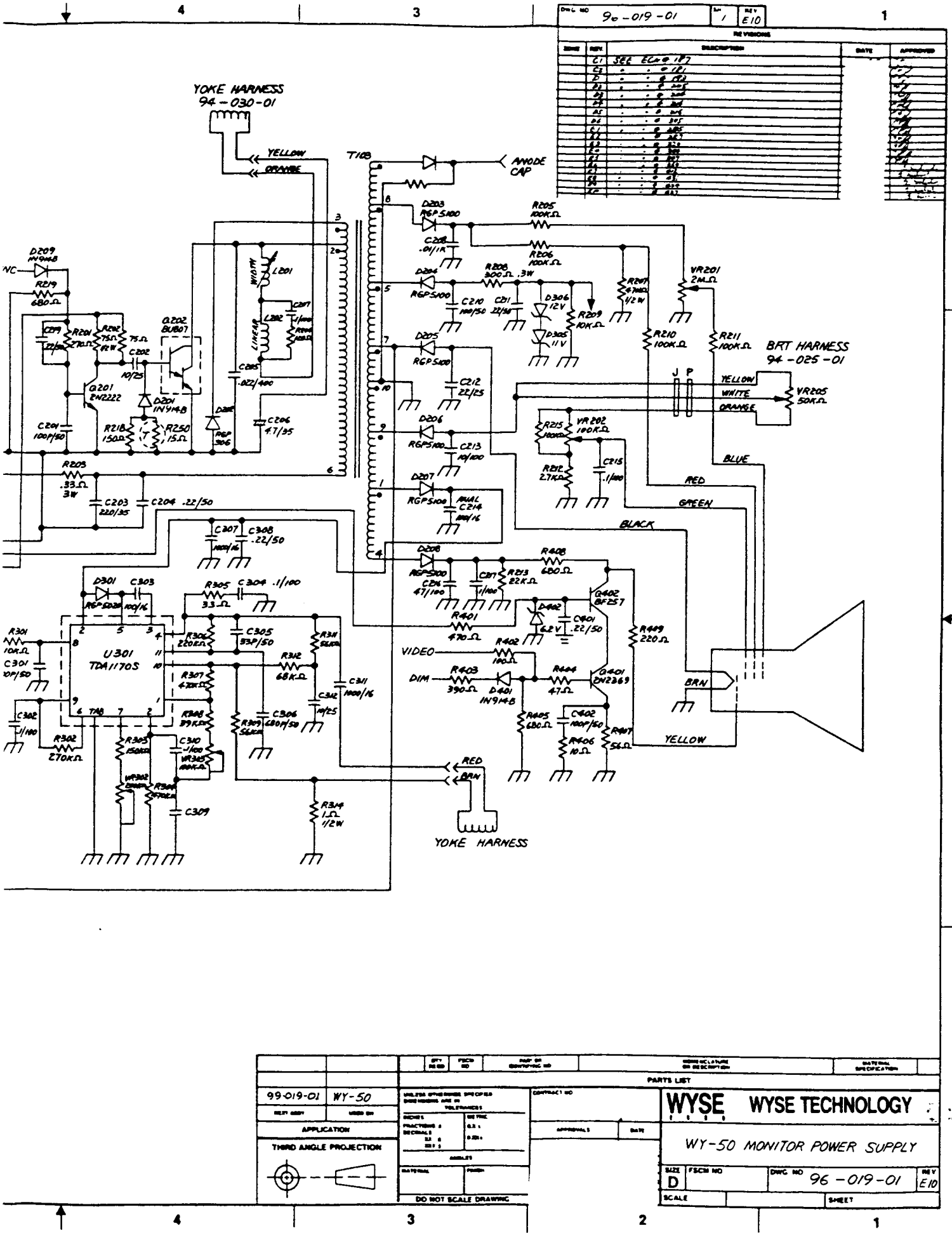
D

C





99-019-01	WY-50
NEXT ASSY	USED ON
APPLICATION	
THIRD ANGLE PROJECTION	



DWG NO	SH	REV
96-019-01	1	E10

REVISIONS

ZONE	REV	DESCRIPTION	DATE	APPROVED
	C1	SEE ECO # 187		
	C2	" " " 191		
	D	" " " 192		
	D1	" " " 203		
	D2	" " " 208		
	D3	" " " 209		
	D4	" " " 215		
	D5	" " " 217		
	E1	" " " 221		
	E2	" " " 222		
	E3	" " " 223		
	E4	" " " 224		
	E5	" " " 225		
	E6	" " " 226		
	E7	" " " 227		
	E8	" " " 228		
	E9	" " " 229		
	E10	" " " 230		

PARTS LIST

99-019-01	WY-50			

APPLICATION

THIRD ANGLE PROJECTION

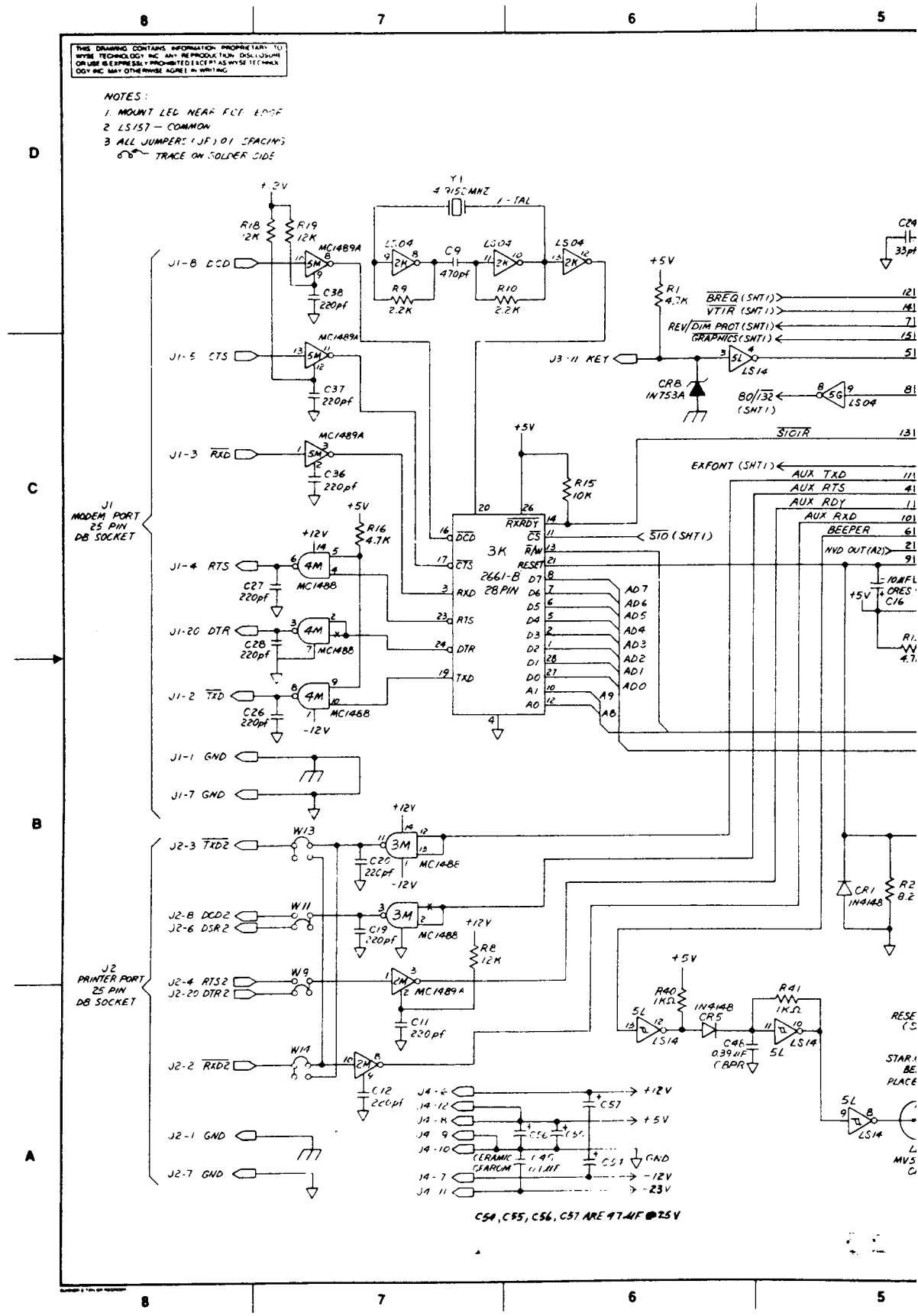
DO NOT SCALE DRAWING

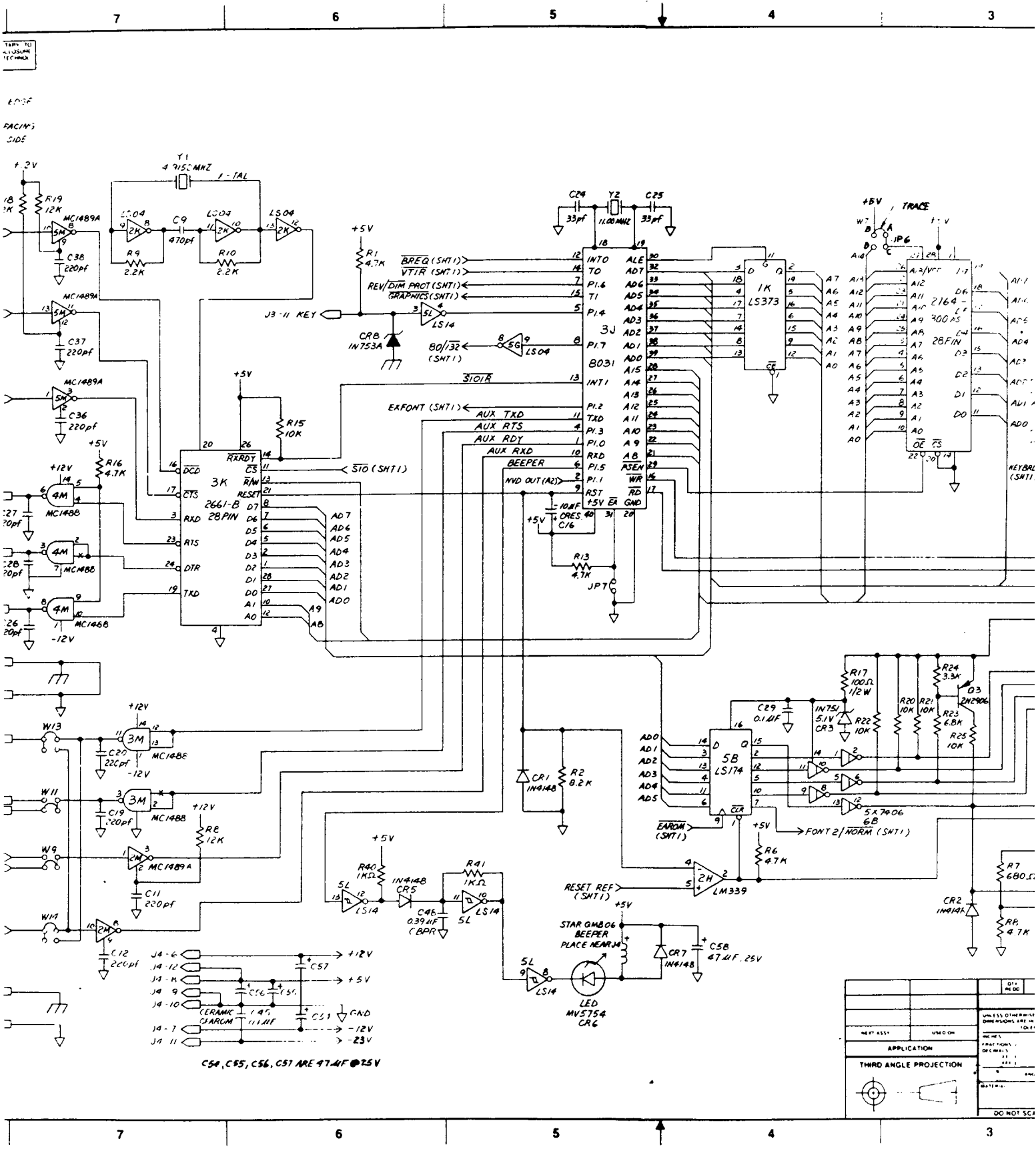
WYSE TECHNOLOGY

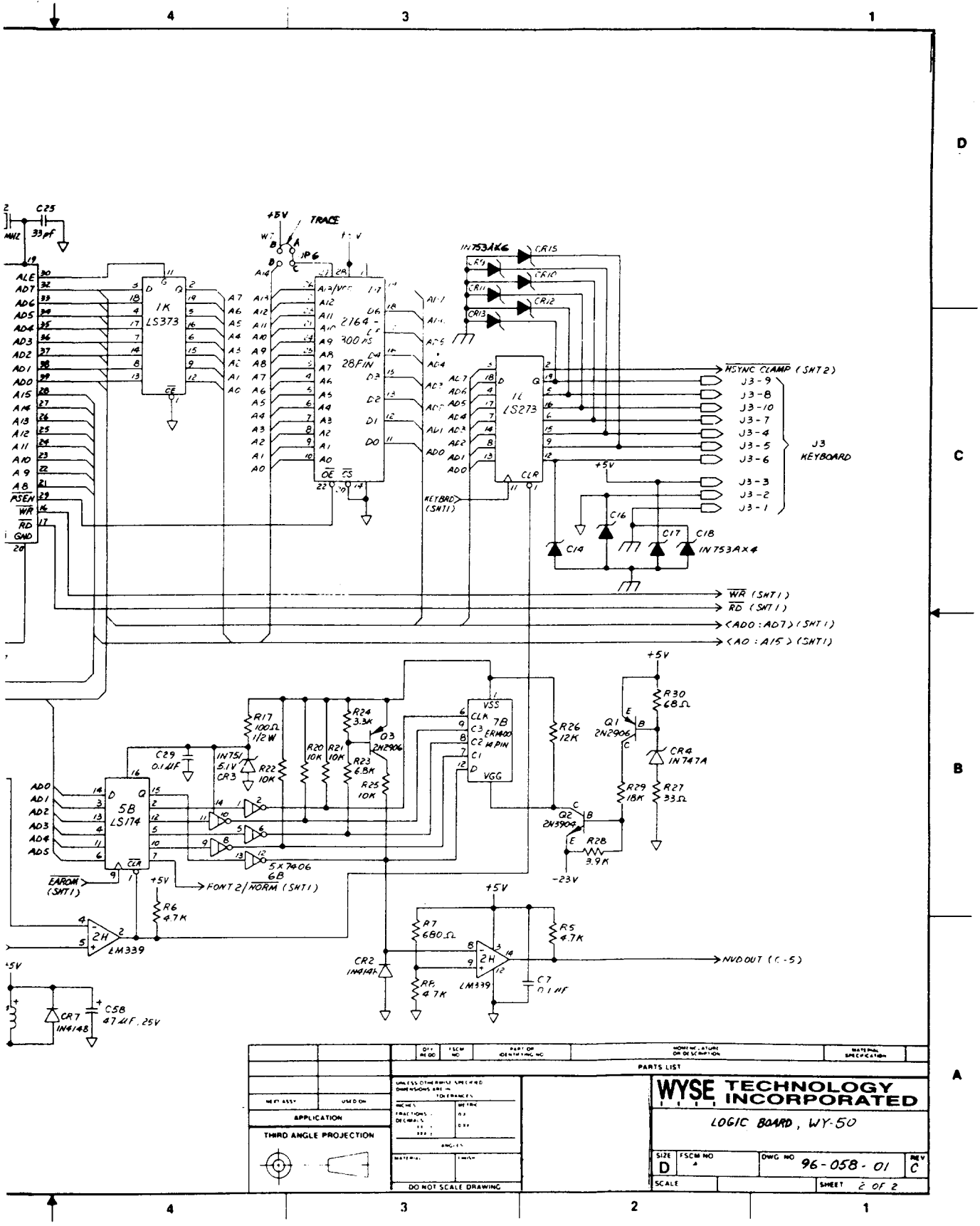
WY-50 MONITOR POWER SUPPLY

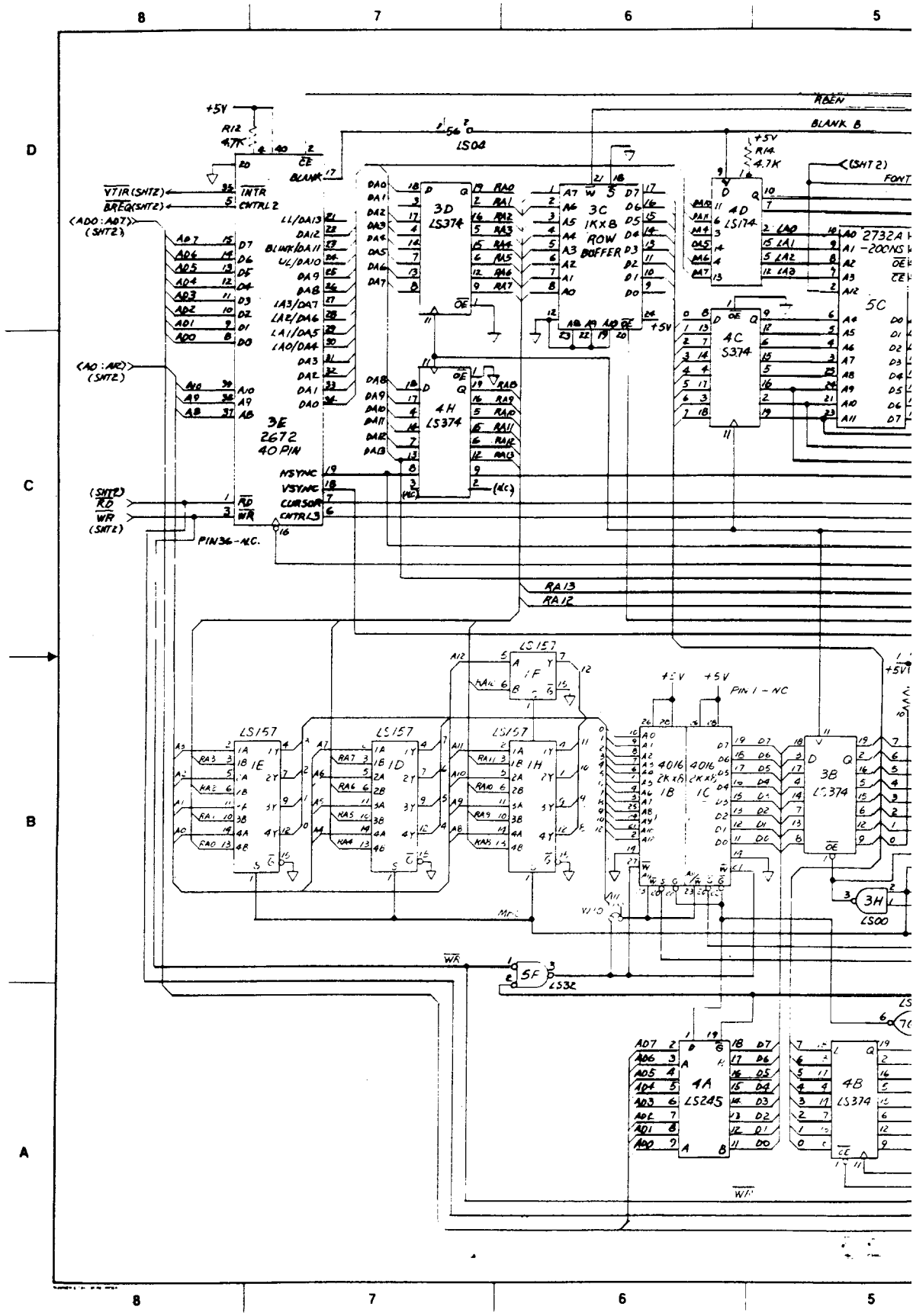
SIZE	FSCM NO	DWG NO	REV
D		96-019-01	E10

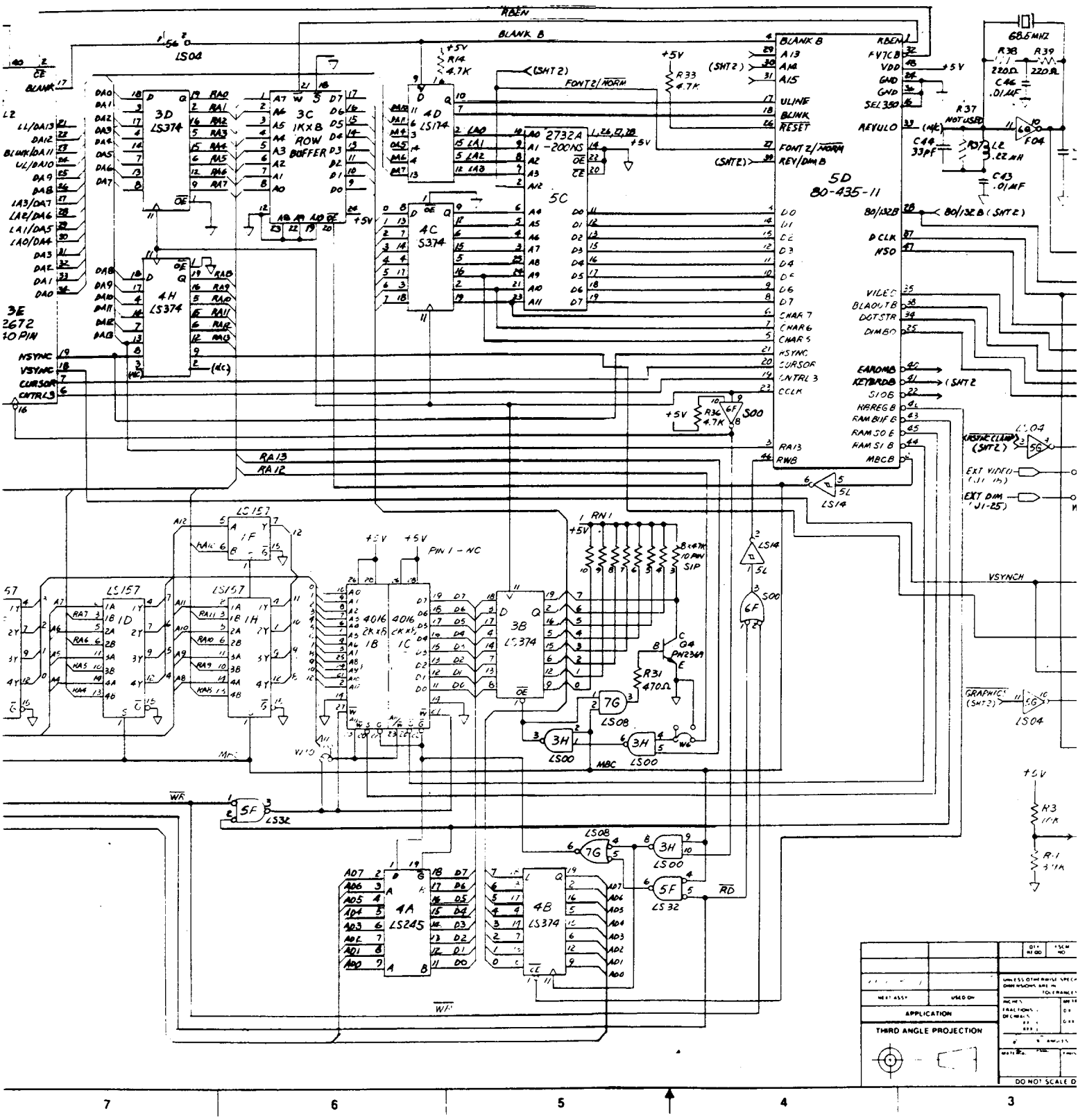
SCALE | SHEET


THIS DRAWING CONTAINS INFORMATION PROPRIETARY TO WYSE TECHNOLOGY INC. ANY REPRODUCTION, DISCLOSURE OR USE IS EXPRESSLY PROHIBITED EXCEPT AS WYSE TECHNOLOGY INC. MAY OTHERWISE AGREE IN WRITING.
NOTES:
1. MOUNT LED NEAR PCB EDGE
2. LS157 — COMMON
3. ALL JUMPERS (JF) 01 SPACING
TRACE ON SOLDER SIDE
Y1 4.915MHZ 1-TAL
J1 MODEM PORT 25 PIN DB SOCKET
J2 PRINTER PORT 25 PIN DB SOCKET
J1-8 DCD
J1-5 CTS
J1-3 RXD
J1-4 RTS
J1-20 DTR
J1-2 TXD
J1-1 GND
J1-7 GND
J2-3 TXD2
J2-8 DCD2
J2-6 DSR2
J2-4 RTS2
J2-20 DTR2
J2-2 RXD2
J2-1 GND
J2-7 GND
MC1489A
MC1488
2661-B 28 PIN
RXRDY
CS
RAN
RESET
D7
D6
D5
D4
D3
D2
D1
D0
A1
A0
DCD
CTS
RXD
RTS
DTR
TXD
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A9
A8
+12V
+5V
-12V
-23V
GND
CERAMIC
CERAMIC
BREQ (SHT1)
VTIR (SHT1)
REV/DIM PROT (SHT1)
GRAPHICS (SHT1)
J3-11 KEY
80/132 (SHT1)
EXFONT (SHT1)
AUX TXD
AUX RTS
AUX RDY
AUX RXD
BEEPER
NVD OUT (A2)
CR8 IN753A
CR1 IN4148
CR5 IN4148
C54, C55, C56, C57 ARE 47.4F @25V


7
6
5
4
3
+12V
Y1
4.915 MHZ
C24
33pf
Y2
11.00 MHZ
C25
33pf
+5V
TRACE
JP6
R19
12K
MC1489A
C38
220pf
LS04
C9
470pf
R9
2.2K
R10
2.2K
R1
4.7K
BREQ (SHT1)
VTIR (SHT1)
REV/DIM PROT (SHT1)
GRAPHICS (SHT1)
J3-11 KEY
CR8
IN753A
80/132 (SHT1)
LS14
LS04
3J
8031
3101R
EXFONT (SHT1)
AUX TXD
AUX RTS
AUX RDY
AUX RXD
BEEPER
NVD OUT (A2)
10μF
CRES
C16
R13
4.7K
JP7
R15
10K
R16
4.7K
3K
2661-B
28 PIN
S10 (SHT1)
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A9
A8
1K
LS373
2164 -
200 NS
28PIN
KEYBRD (SHT1)
-12V
W13
W11
W9
W14
C20
22Cpf
C19
220pf
C11
220pf
C12
220pf
R8
12K
MC1488
MC1489A
J4-6
J4-12
J4-8
J4-9
J4-10
J4-7
J4-11
+12V
+5V
GND
-12V
-23V
C57
C56
C55
C54
CERAMIC
CERAMIC
C54, C55, C56, C57 ARE 47μF @25V
CR1
IN4148
R2
8.2K
R40
1KΩ
CR5
R41
1KΩ
C46
0.39μF
(BPR)
RESET REF (SHT1)
STAR GM806
BEEPER
PLACE NEAR J4
LED
MV5754
CR6
CR7
IN4148
C58
47μF, 25V
5B
LS174
EAROM (SHT1)
C29
0.1μF
IN751
5.1V
CR3
R22
10K
R17
100Ω
1/2W
R24
3.3K
Q3
2N2906
R20
10K
R21
10K
R23
6.8K
R25
10K
5X7406
6B
FONT 2/NORM (SHT1)
R6
4.7K
LM339
2H
R7
680Ω
CR2
IN4148
RP
4.7K
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCA


4
3
1
D
C
B
A
C25
33pf
1K
LS373
+5V
TRACE
JP6
2164-
300 NS
28PIN
1N753AKG
CR15
CR10
CR11
CR12
CR13
LS273
NSYNC CLAMP (SHT2)
J3-9
J3-8
J3-10
J3-7
J3-4
J3-5
J3-6
J3
KEYBOARD
J3-3
J3-2
J3-1
KEYBRD (SHT1)
C16
C17
C18
C14
IN753Ax4
WR (SHT1)
RD (SHT1)
(AD0:AD7) (SHT1)
(A0:A15) (SHT1)
R17
100Ω
1/2W
R24
3.3K
Q3
2N2906
R20
10K
R21
10K
R23
6.8K
R25
10K
R22
10K
C29
0.1μF
IN751
5.1V
CR3
5B
LS174
5X7406
6B
EAROM (SHT1)
FONT2/NORM (SHT1)
R6
4.7K
2H
LM339
7B
ERM00
14 PIN
VGG
R26
12K
Q1
2N2906
R30
68Ω
CR4
IN747A
R29
18K
R27
33Ω
Q2
2N5906
R28
3.9K
-23V
R7
680Ω
R5
4.7K
CR2
IN4148
R8
4.7K
C7
0.1 MF
NVD OUT (1-5)
CR7
IN4148
C58
47μF, 25V
PARTS LIST
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
WYSE TECHNOLOGY INCORPORATED
LOGIC BOARD, WY-50
SIZE D
FSCM NO
DWG NO 96-058-01
REV C
SCALE
SHEET 2 OF 2


8
7
6
5
D
C
B
A
+5V
R12
4.7K
LS04
RBEN
BLANK B
3E
2672
40 PIN
3D
LS374
3C
1K X 8
ROW
BUFFER
4D
LS174
4C
S374
4H
LS374
5C
2732A
-200NS
LS157
1F
1E
1D
1H
1B
1C
4016
2K X 8
3B
LS374
3H
LS00
5F
LS32
4A
LS245
4B
LS374
PIN 1 - NC
PIN36-NC.
RA13
RA12
WR
RD
VSYNC
HSYNC
CURSOR
CNTRL3
CNTRL2
INTR
BLANK
BLINK/DA11
UL/DA10
LL/DA13
LA3/DA7
LA2/DA6
LA1/DA5
LA0/DA4
(SHT2)
FONT


RBEN
BLANK B
LS04
3D LS374
3C 1KX8 ROW BUFFER
4D LS174
2732A -200NS
5C
4C S374
4H LS374
5D 80-435-11
68.5MHZ
R38 220Ω
R39 220Ω
C46 .01μF
R37 NOT USED
C44 33pF
L2 3.22μH
C43 .01μF
FONT2/NORM
REV/DIM B
BLANK B
RESET
ULINE
BLINK
VIDEO
BLADJ B
DOTSTR
DIMBO
EAROMB
KEYBRDB
SIOB
NMREG B
RAMBUF B
RAMSO B
RAMSI B
MBCB
RWB
RA13
RA12
LS157
1F
1D
1H
1B
1C
4016 2K x 8
3B LS374
RN1 8 x 47K 10 PIN SIP
Q4 PN2369
R31 470Ω
LS08
LS00
LS32
4A LS245
4B LS374
R33 4.7K
R34 4.7K
R14 4.7K
R3 10K
R-1 3.01K
VSYNCH
GRAPHICS (SHT2)
EXT VIDEO (J1-15)
EXT DIM (J1-25)
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE D

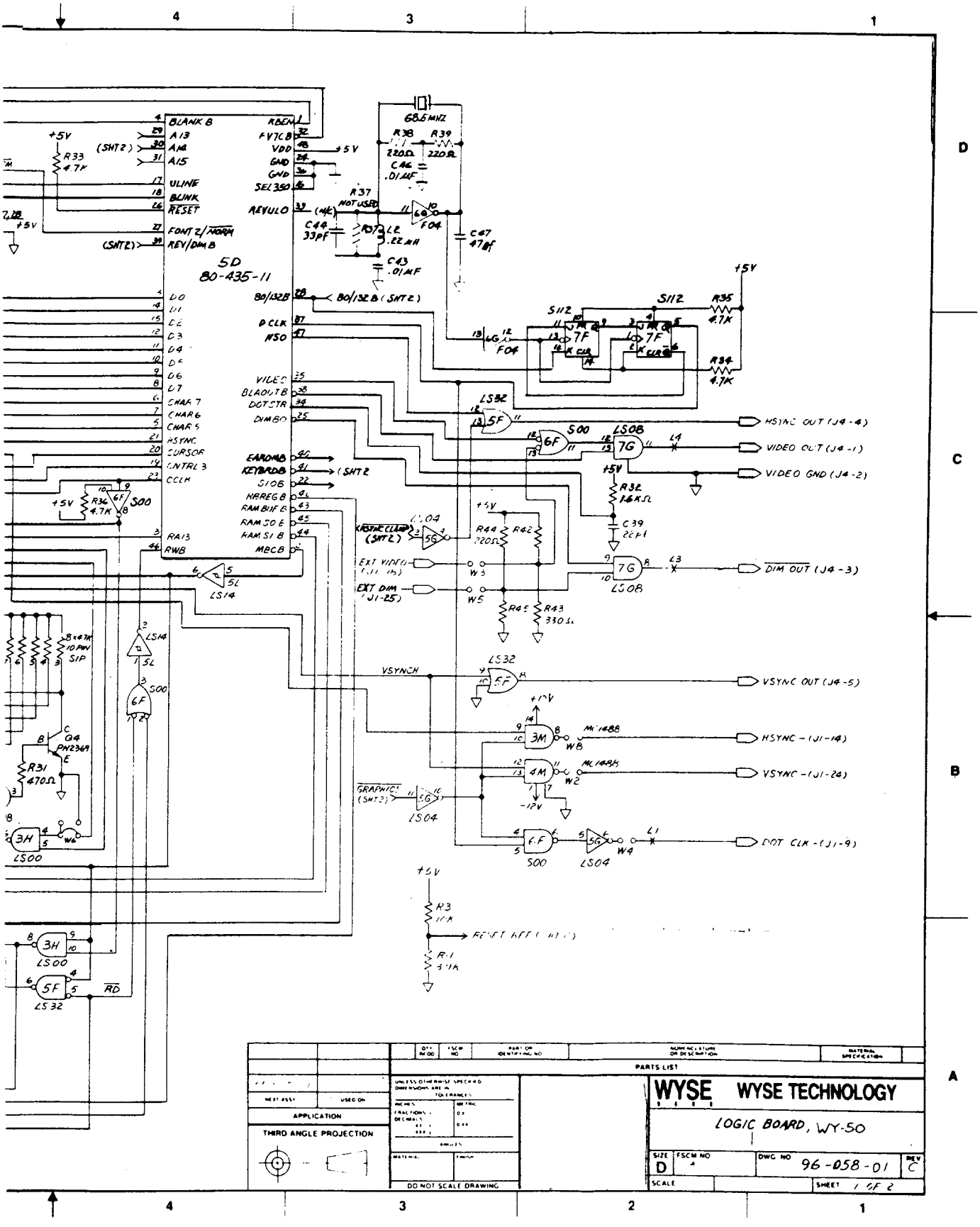
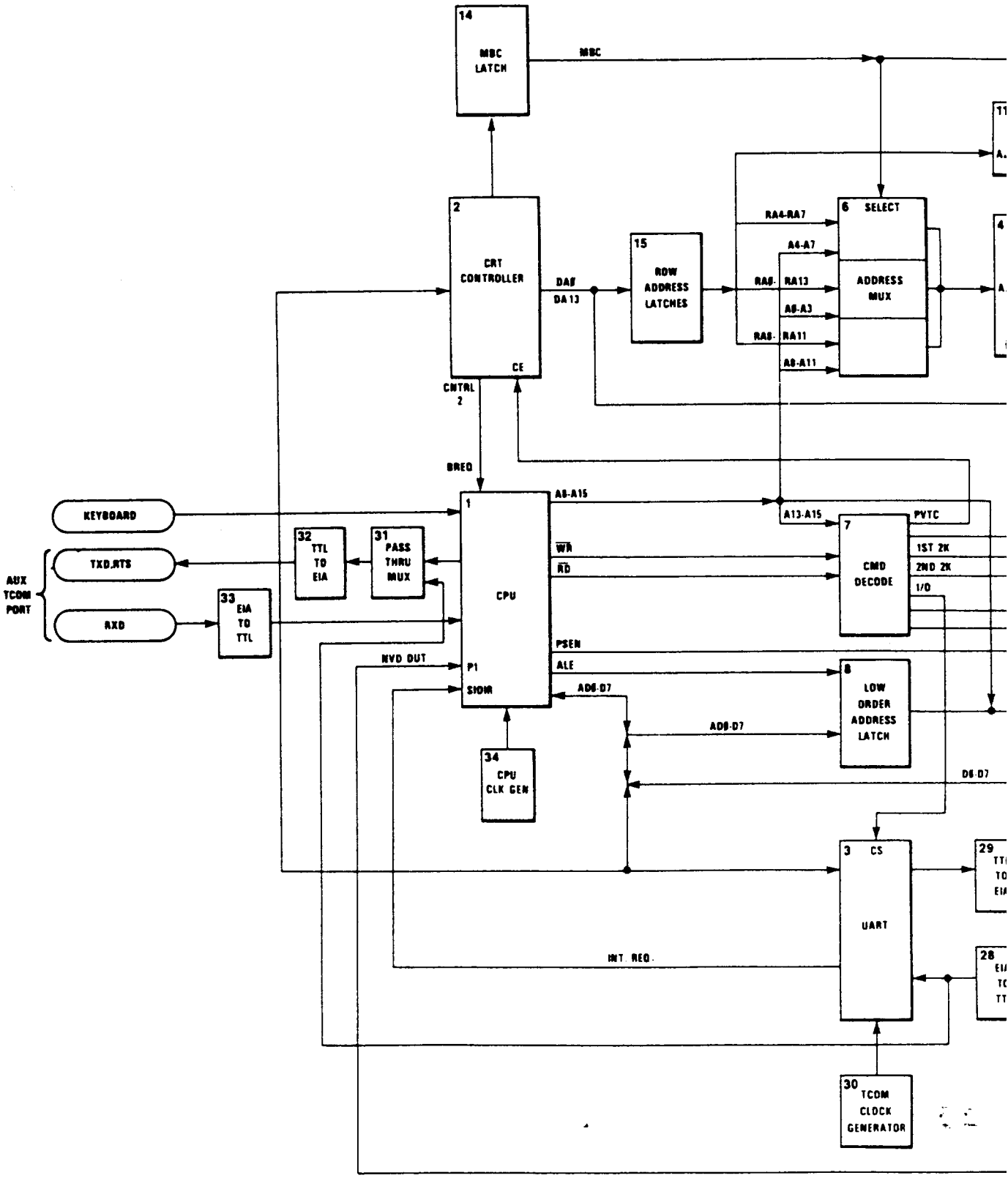
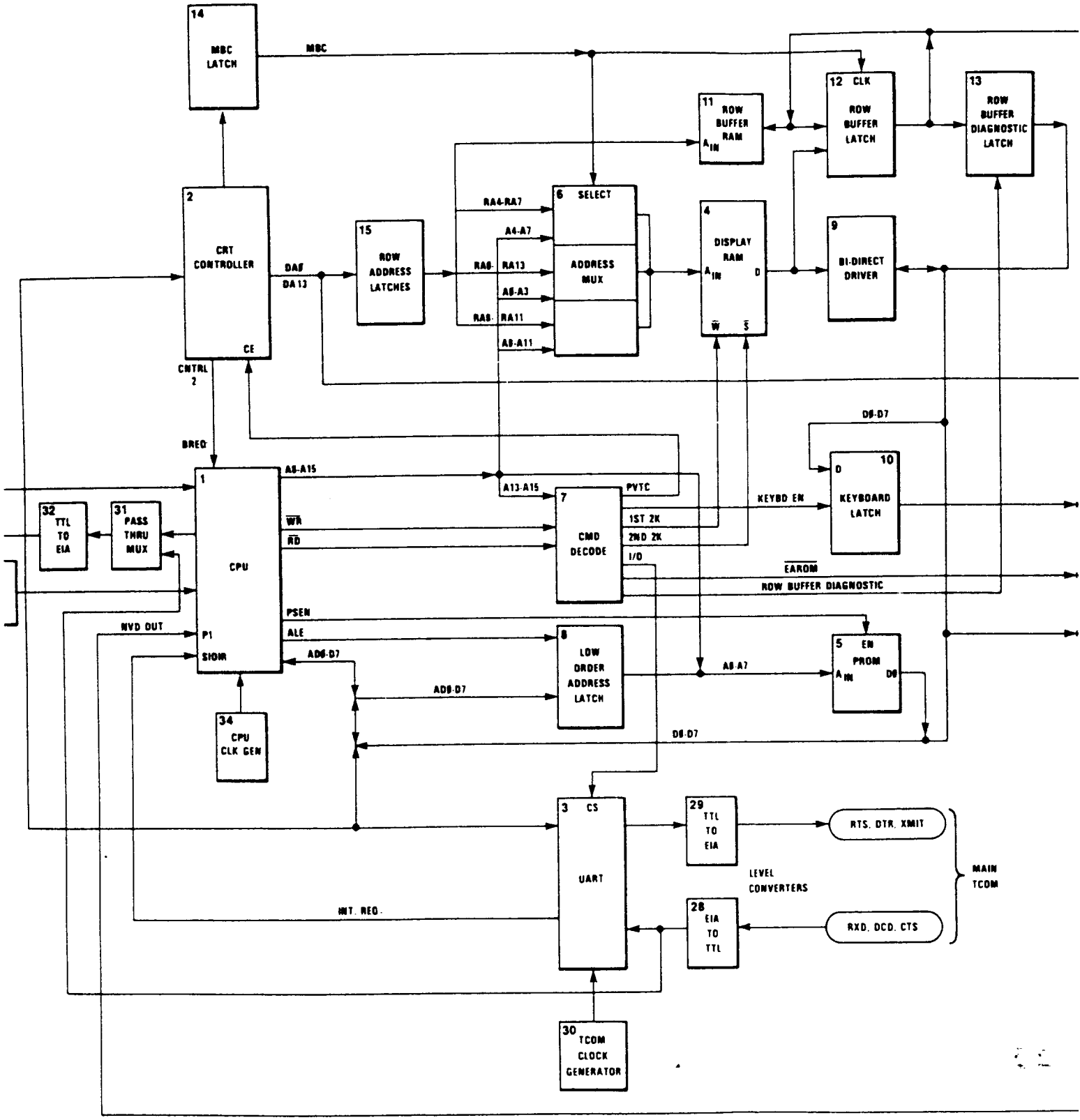
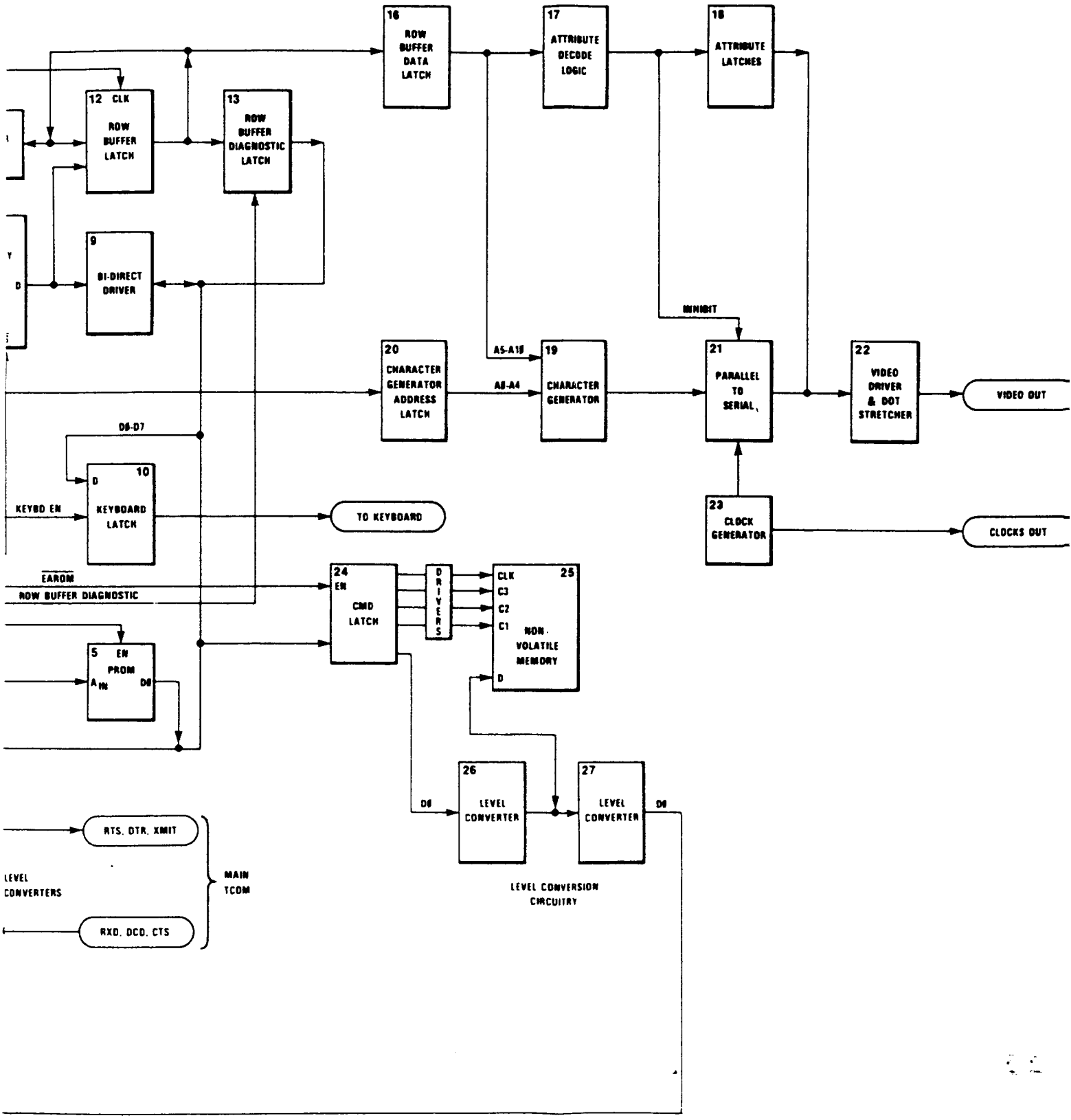

5D
80-435-11
68.6 MHZ
R38 220Ω
R39 220Ω
C46 .01MF
R37 NOT USED
C44 33pF
C47 47pf
C43 .01MF
+5V
R33 4.7K
R35 4.7K
R34 4.7K
S112
7F
F04
LS32
5F
S00
6F
LS08
7G
LA
R32 1.6KΩ
C39 22pf
R44 220Ω
R42
R45
R43 330Ω
LS04
5G
W3
W5
LS14
5L
8x4.7K 10 PIN SIP
Q4 PN2369
R31 470Ω
3H
W6
LS00
3M
4M
W8
W2
-12V
F.F
W4
LA
LB
LC
LD
R3 10K
R1 3.9K
HSYNC OUT (J4-4)
VIDEO OUT (J4-1)
VIDEO GND (J4-2)
DIM OUT (J4-3)
VSYNC OUT (J4-5)
HSYNC - (J1-14)
VSYNC - (J1-24)
DOT CLK - (J1-9)
EXT VIDEO (J1-15)
EXT DIM (J1-25)
VSYNCH
GRAPHICS (SHT2)
RESET KEY (J1-17)
RD
BLANK B
A13
A14
A15
ULINE
BLINK
RESET
FONT2/NORM
REV/DIM B
RBEM
FVTCB
VDD
GND
SEL350
REVULO
80/132B
DCLK
HSO
VILES
BLAOUTB
DOTSTR
DIMBO
EAROMB
KEYBRDB
SIOB
NRREGB
RAMBUFB
RAMSOE
RAMSIB
MBCB
RA13
RWB
D0
D1
D2
D3
D4
D5
D6
D7
CHAR 7
CHAR 6
CHAR 5
HSYNC
CURSOR
CNTRL 3
CCLK
(SHT2)
PARTS LIST
WYSE TECHNOLOGY
LOGIC BOARD, WY-50
SIZE D
FSCM NO
DWG NO 96-058-01
REV C
SCALE
SHEET 1 OF 2
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

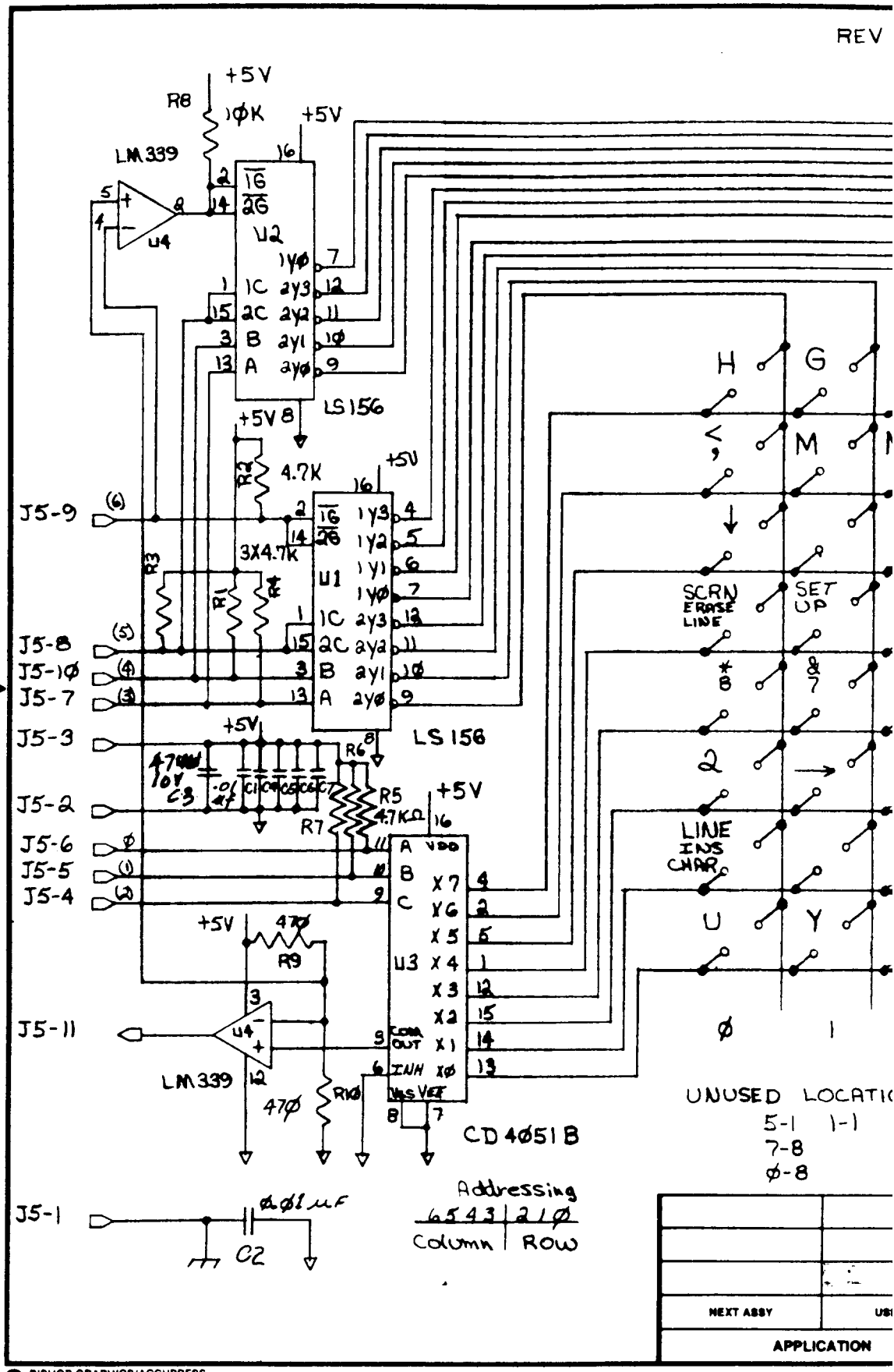
Figure 6-2 Microprocessor PCB Block Diagram



rocessor PCB Block Diagram



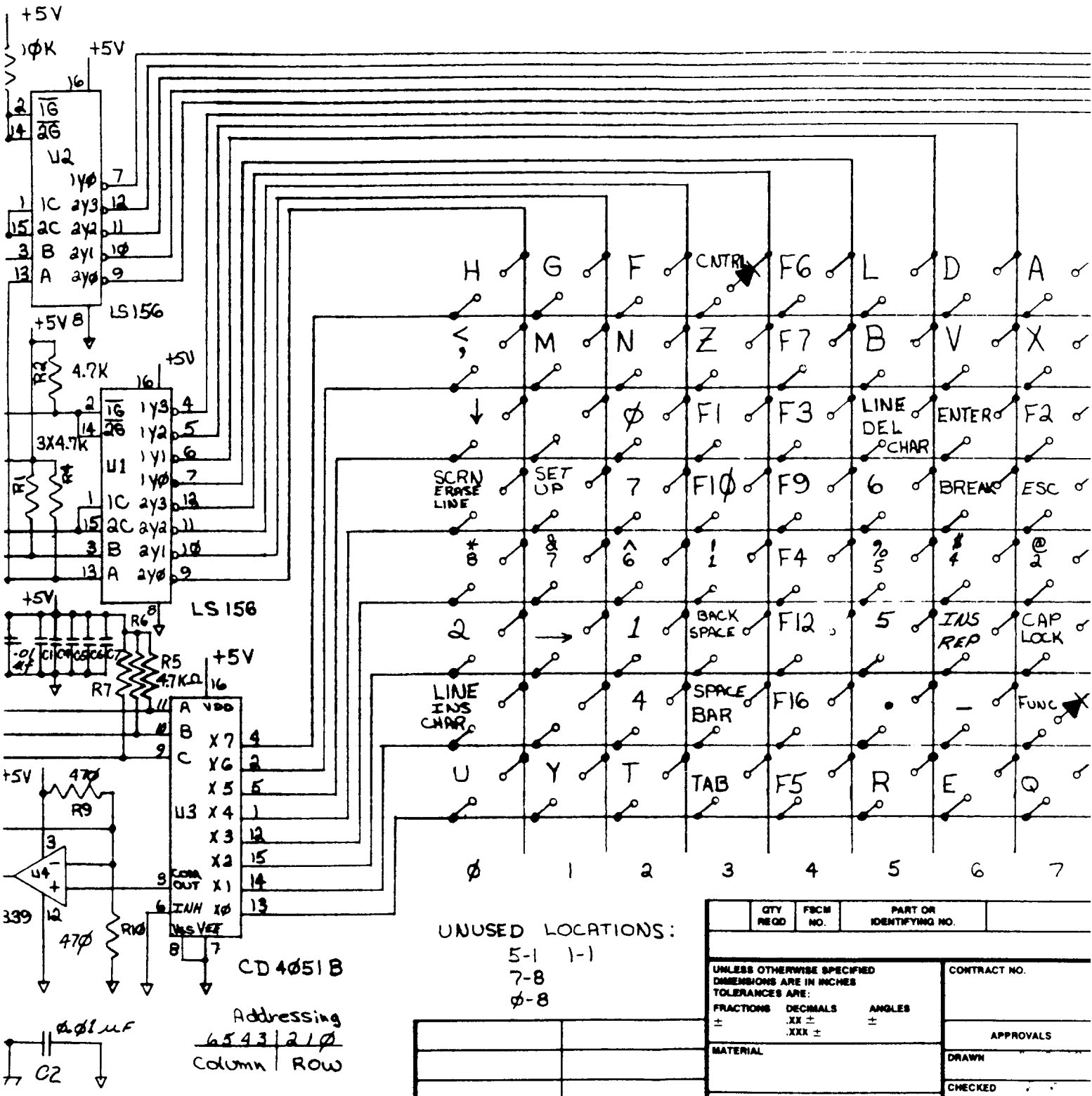

16
ROW BUFFER DATA LATCH
17
ATTRIBUTE DECODE LOGIC
18
ATTRIBUTE LATCHES
12 CLK
ROW BUFFER LATCH
13
ROW BUFFER DIAGNOSTIC LATCH
9
BI-DIRECT DRIVER
INHIBIT
20
CHARACTER GENERATOR ADDRESS LATCH
A5-A10
A0-A4
19
CHARACTER GENERATOR
21
PARALLEL TO SERIAL
22
VIDEO DRIVER & DOT STRETCHER
VIDEO OUT
D0-D7
10
KEYBD EN
KEYBOARD LATCH
TO KEYBOARD
23
CLOCK GENERATOR
CLOCKS OUT
EAROM
ROW BUFFER DIAGNOSTIC
24
EN
CMD LATCH
DRIVERS
CLK
C3
C2
C1
D
25
NON-VOLATILE MEMORY
5 EN
PROM
D0
26
LEVEL CONVERTER
27
LEVEL CONVERTER
D0
RTS, DTR, XMIT
LEVEL CONVERTERS
MAIN TCOM
RXD, DCD, CTS
LEVEL CONVERSION CIRCUITRY



BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A19930

DWG. NO. | SH

REV 3 Change Pullups to 4.7K Ω



UNUSED LOCATIONS:
5-1 1-1
7-8
Ø-8

QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

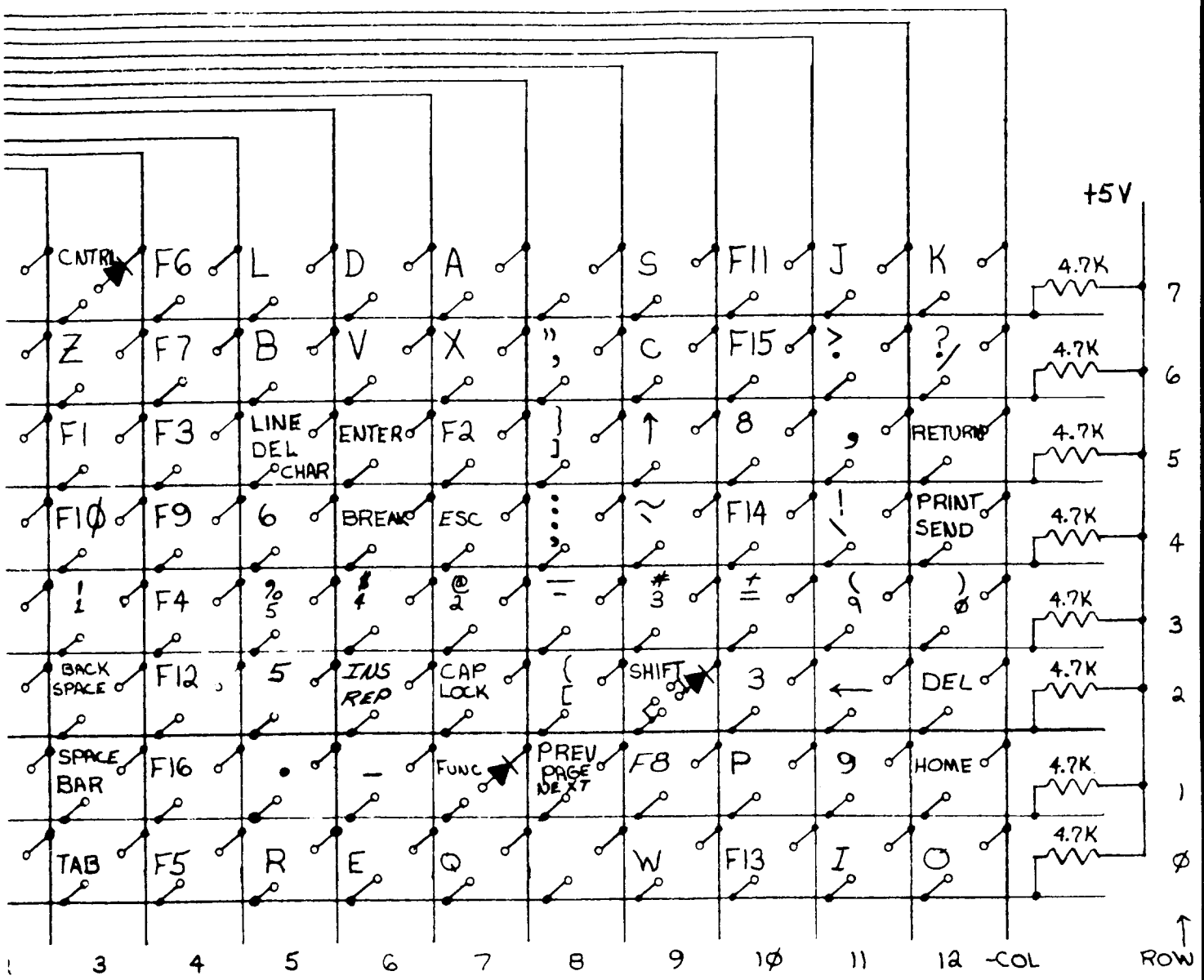
CONTRACT NO.

APPROVALS
DRAWN
CHECKED
ISSUED

DWG. NO.	SH	REV.

Change Pullups to 4.7K Ω

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED
2	Add Control key		



QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

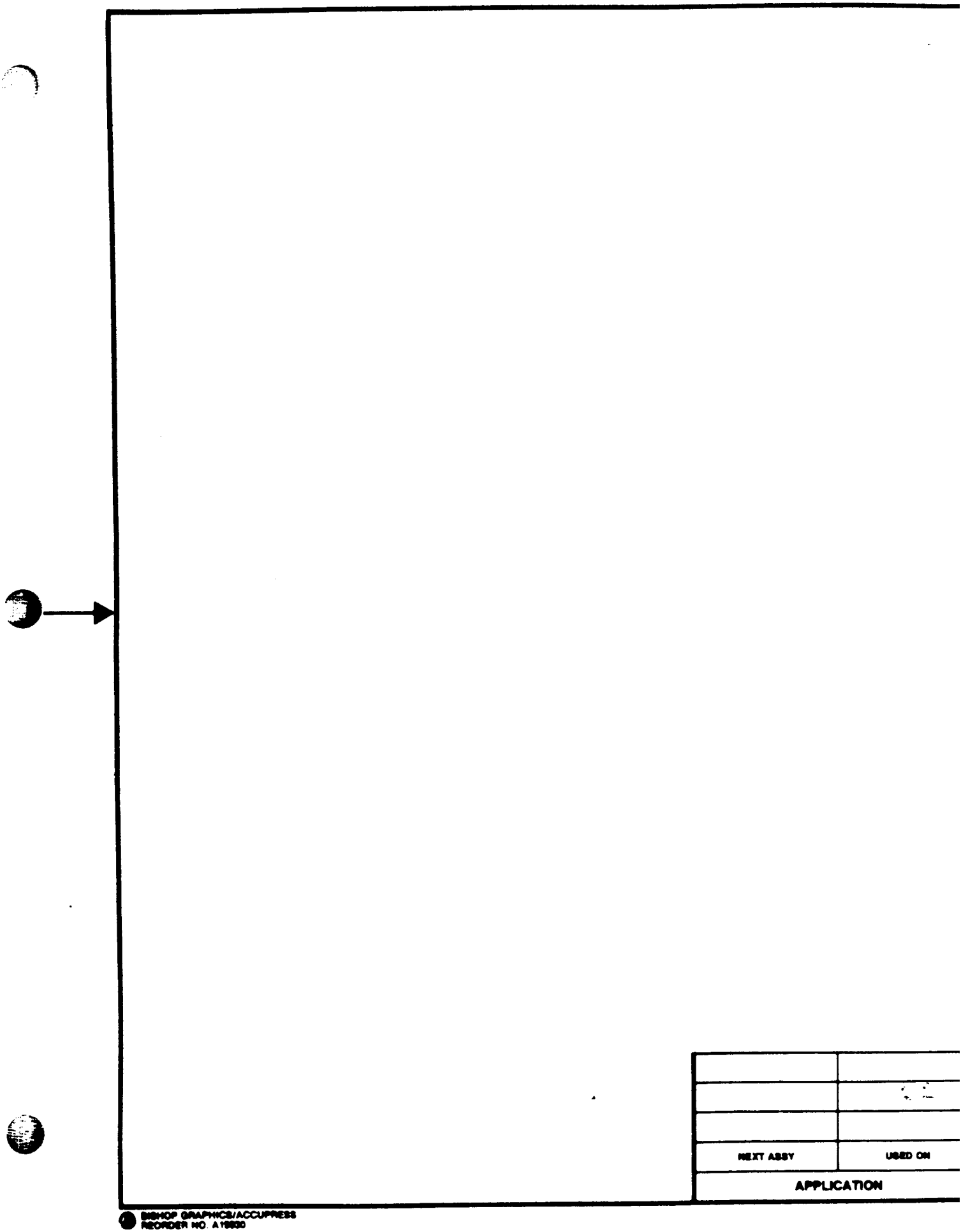
APPROVALS	DATE
DRAWN	
CHECKED	
ISSUED	

WYSE TECHNOLOGY

KEYBOARD SCHEMATIC

SIZE	FSCM NO.	DWG. NO.	REV.
B		96-013-01	D

SCALE | SHEET 1 of 1



BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A19830

DWG. NO.	SH

	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:

FRACTIONS	DECIMALS	ANGLES
±	.XX ±	±
	.XXX ±	

MATERIAL

FINISH

CONTRACT NO.

APPROVALS

DRAWN

CHECKED

ISSUED

NEXT ASSY	USED ON
APPLICATION	

DO NOT SCALE DRAWING

DWG. NO.	SH	REV.

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
B	Rev Dot CLK Oscillator, Inhibit H-Sync on Pwr-up Replace CCLK w/ Dot CLK on graphics Interface		1
C	Add 5.1V Zener & 100Ω Res to EAROM CKT.		
D	Add 1 ply to H-Sync Separate GND for Video to monitor.		
D1	change R5, R24, R25 to 12K ohm 1/4W 5%		
D2	Remove Sockets, 3L, 3J, 6J		
D3	Loration 3F changed to 1K x 8 static Ram Sy2158A		

	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

PARTS LIST

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS	DATE
DRAWN Mike Bill	6-2-83
CHECKED	
ISSUED	

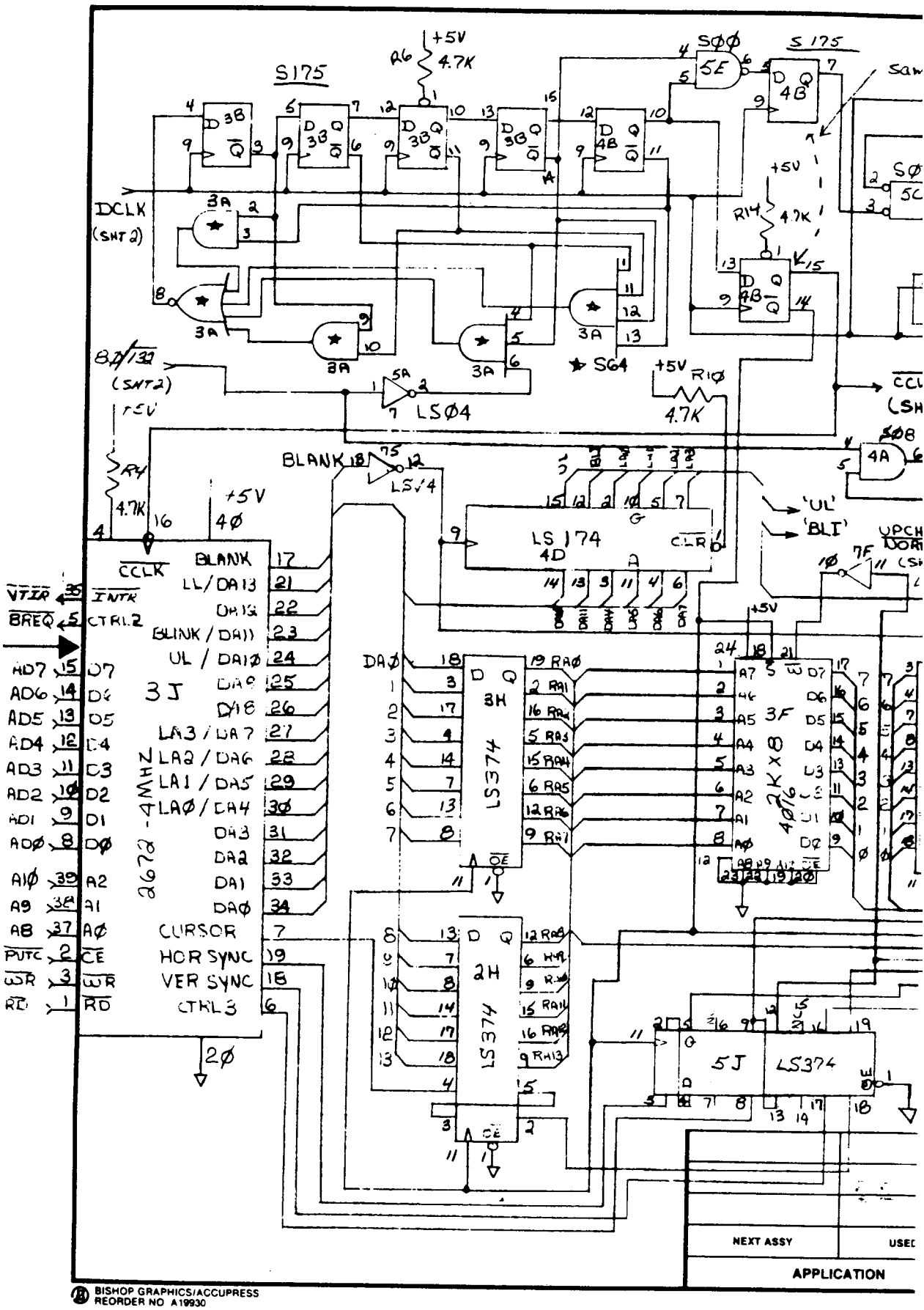
WYSE TECHNOLOGY

LOGIC BOARD, WY-50

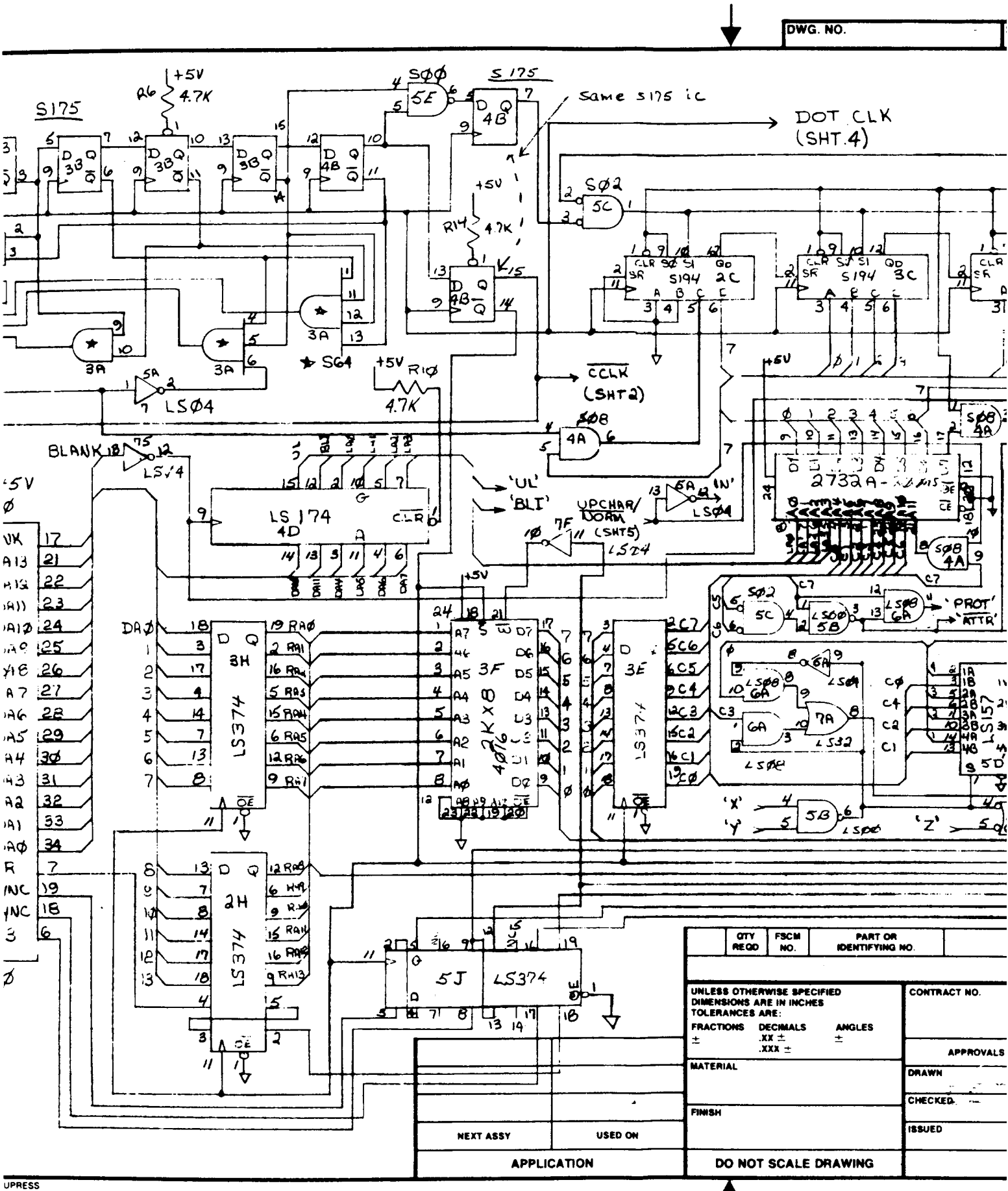
SIZE	FSCM NO.	DWG. NO.	REV.
B		96-012-01	D3

SCALE

SHEET 0 of 7



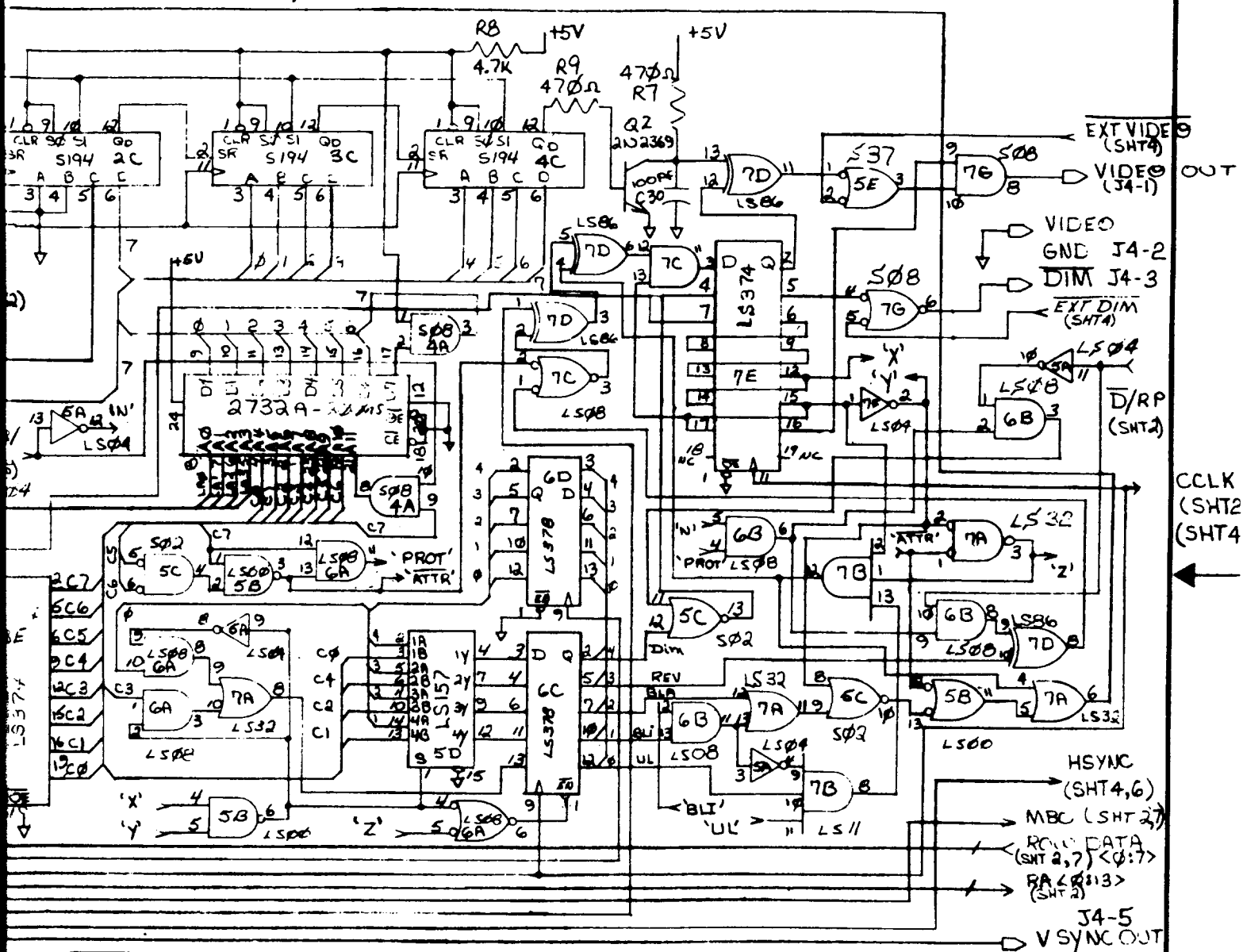
BISHOP GRAPHICS/ACCUPRESS
REORDER NO A19930


DWG. NO.
S175
+5V
R6
4.7K
SØØ
5E
S175
Same S175 IC
DOT CLK
(SHT.4)
SØ2
5C
R14
4.7K
+5V
V15
S194 2C
S194 3C
3A
SG4
+5V
RIØ
4.7K
CCLK
(SHT2)
LSØ4
SØ8
4A
BLANK
LS174
4D
'UL'
'BLI'
UPCHAR/
WORM
(SHT5)
LS74
2732A-
PROT'
ATTR'
LS374
3H
2H
3F
2K X 8
3E
5J
LS374
'X'
'Y'
'Z'
5B
LSØ8
6A
LSØ4
7A
LS32
5C
5D
LS157
DA Ø
DA 1
DA 2
DA 3
DA 4
DA 5
DA 6
DA 7
DA 8
DA 9
DA 10
DA 11
DA 12
DA 13
INC
INC
5V
Ø
QTY REQD
FSCM NO.
PART OR IDENTIFYING NO.
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE:
FRACTIONS ±
DECIMALS .XX ± .XXX ±
ANGLES ±
CONTRACT NO.
APPROVALS
DRAWN
CHECKED
ISSUED
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
UPRESS

DWG. NO.	SH	REV.

REVISIONS

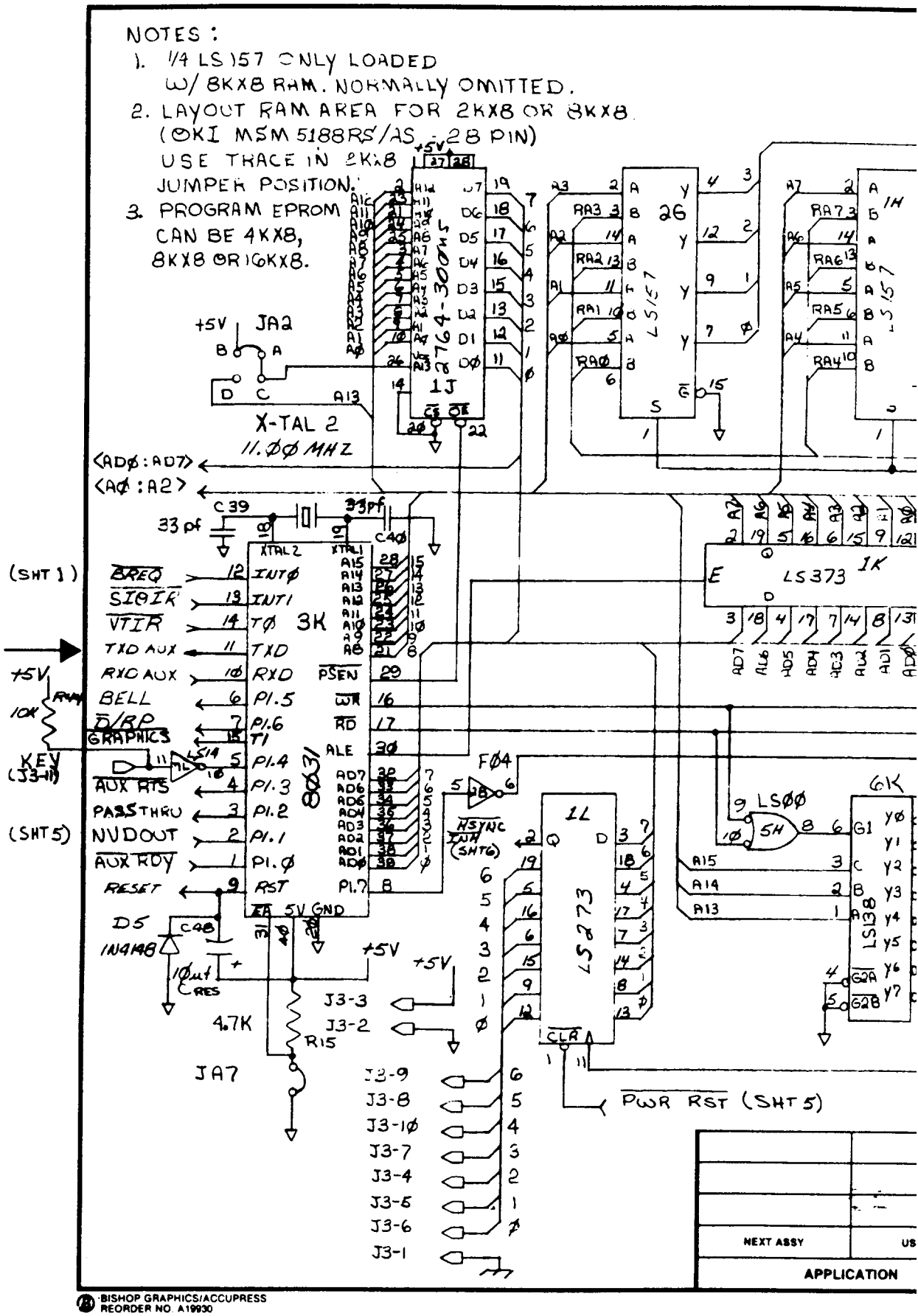
REV.	DESCRIPTION	DATE	APPROVED



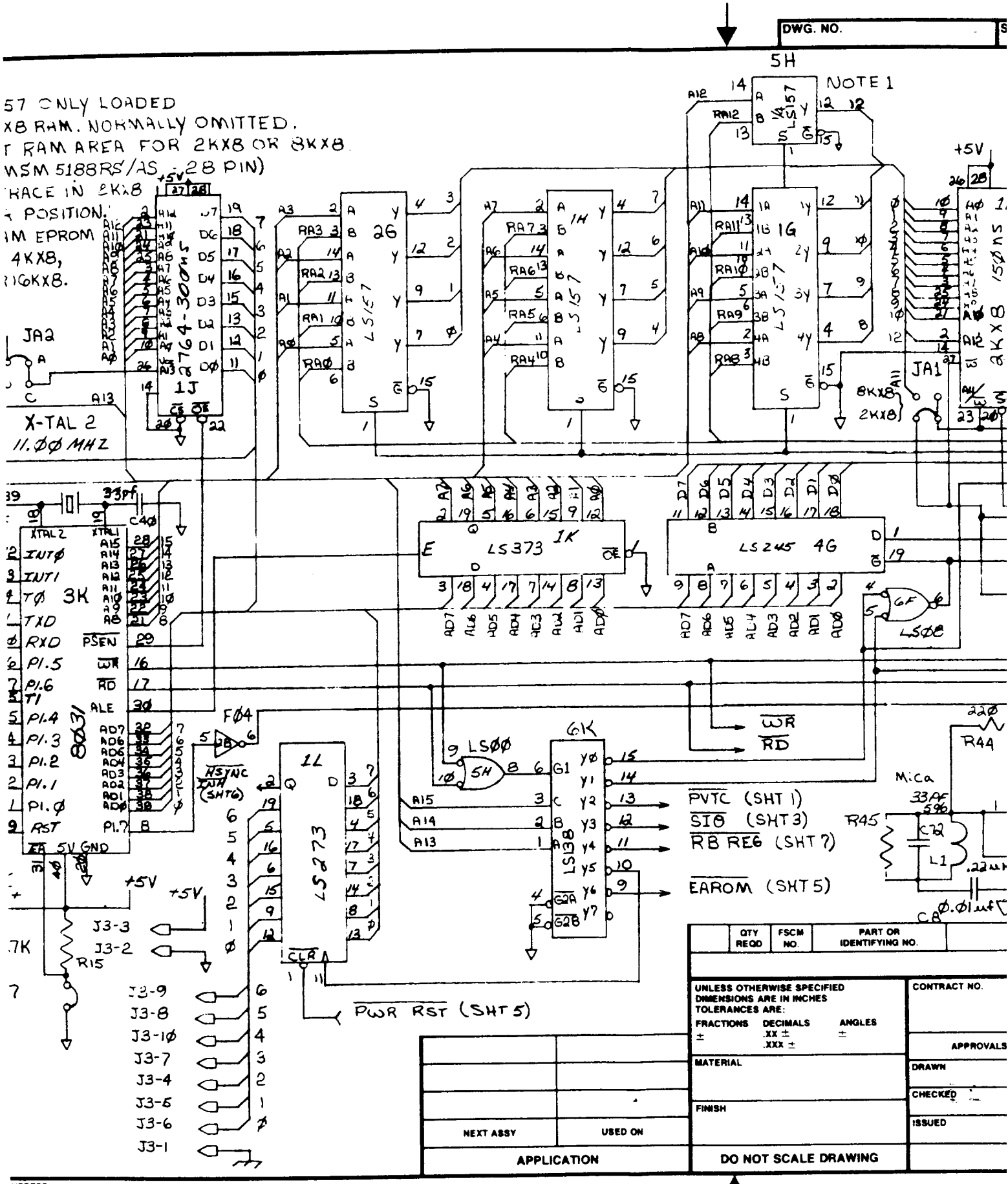
QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

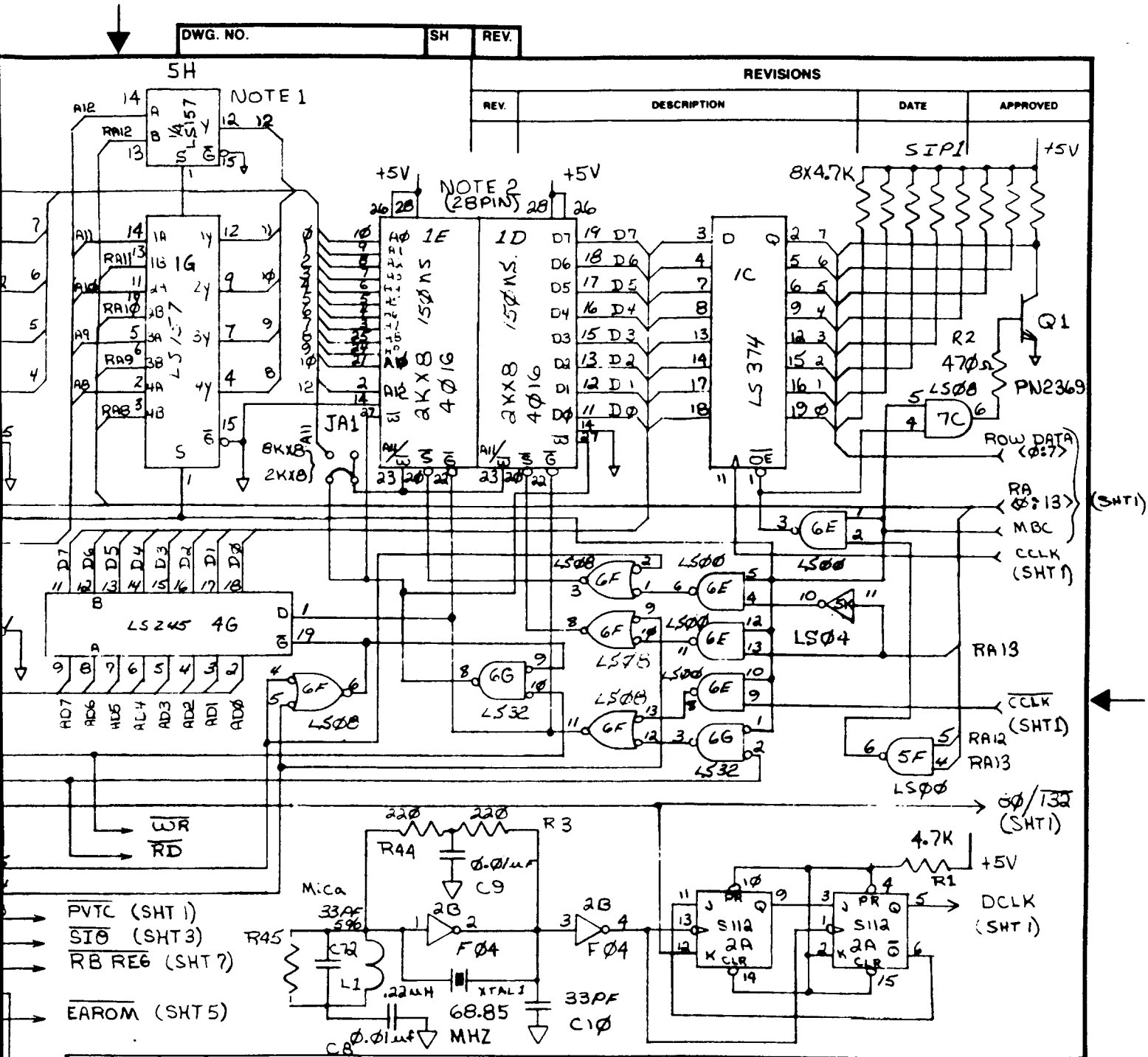
PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.	WYSE TECHNOLOGY
MATERIAL	APPROVALS / DRAWN / CHECKED / ISSUED — DATE	LOGIC BOARD, WY5Ø
FINISH		SIZE B · FSCM NO. · DWG. NO. 96-Ø12-Ø1 · REV. D3
DO NOT SCALE DRAWING		SCALE · SHEET 1 OF 7

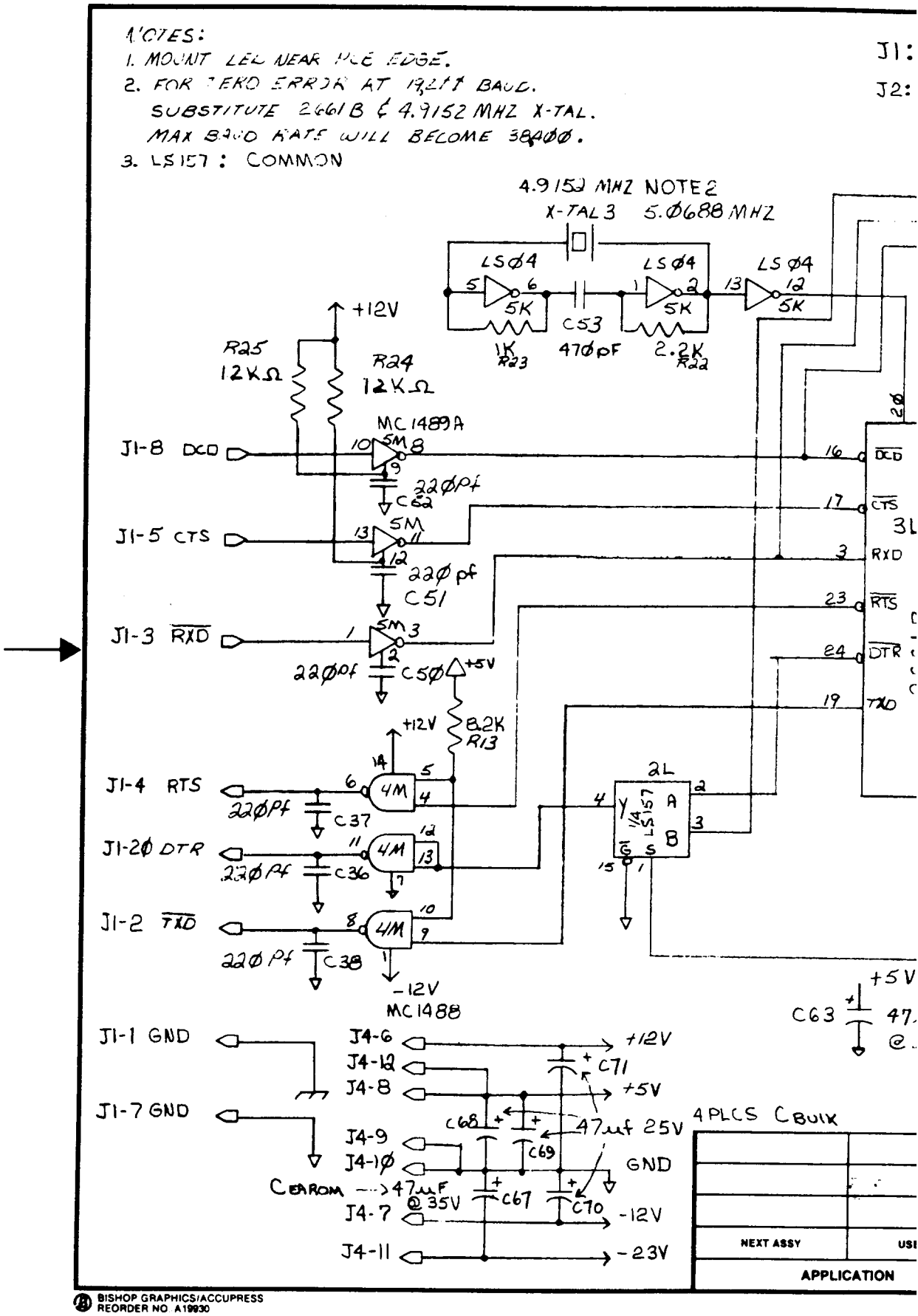


BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A19930


DWG. NO.
5H
NOTE 1
57 ONLY LOADED
X8 RAM. NORMALLY OMITTED.
T RAM AREA FOR 2KX8 OR 8KX8
MSM 5188RS/AS, 28 PIN)
RACE IN 2KX8
POSITION.
M EPROM
4KX8,
16KX8.
JA2
X-TAL 2
11.00 MHZ
2764-300NS
1J
26
1H
1G
LS157
LS373
1K
LS245
4G
LS08
8KX8
2KX8
JA1
33pf
C40
8031
XTAL2
XTAL1
INT0
INT1
T0
TXD
RXD
P1.5
P1.6
T1
P1.4
P1.3
P1.2
P1.1
P1.0
RST
EA
5V
GND
PSEN
WR
RD
ALE
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
P1.7
F04
HSYNC
INTH (SHT6)
1L
LS273
CLR
PWR RST (SHT5)
LS00
5H
6K
LS138
PVTC (SHT1)
SIO (SHT3)
RB REG (SHT7)
EAROM (SHT5)
WR
RD
220
R44
MICA
33pf
5%
R45
C72
L1
.22uH
.01uf
C8
J3-3
J3-2
J3-9
J3-8
J3-10
J3-7
J3-4
J3-5
J3-6
J3-1
R15
7K
QTY REQD
FSCM NO.
PART OR IDENTIFYING NO.
UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS
DECIMALS
ANGLES
.XX ±
.XXX ±
MATERIAL
FINISH
CONTRACT NO.
APPROVALS
DRAWN
CHECKED
ISSUED
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
UPRESS


DWG. NO.
SH
REV.
5H
REVISIONS
REV.
DESCRIPTION
DATE
APPROVED
NOTE 1
NOTE 2
(28PIN)
+5V
SIP1
8X4.7K
Q1
PN2369
R2
470Ω
ROW DATA
RA
MBC
CCLK
(SHT1)
LS245 4G
LS374 1C
LS157
LS04
LS08
LS32
LS75
JA1
8KX8
2KX8
RA13
RA12
WR
RD
220
R44
R3
0.01uf
C9
Mica
33PF
5%
R45
C12
L1
.22uH
XTAL1
68.85
MHZ
33PF
C10
C8
0.01uf
4.7K
R1
DCLK
(SHT 1)
PVTC (SHT 1)
SIO (SHT3)
RB REG (SHT 7)
EAROM (SHT 5)
PARTS LIST
QTY REQD
FSCM NO.
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
MATERIAL SPECIFICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS
DECIMALS
.XX ±
.XXX ±
ANGLES
CONTRACT NO.
APPROVALS
DATE
DRAWN
CHECKED
ISSUED
MATERIAL
FINISH
DO NOT SCALE DRAWING
WYSE TECHNOLOGY
LOGIC BOARD, WY50
SIZE
B
FSCM NO.
DWG. NO.
96-012-01
REV.
D3
SCALE
SHEET 2 OF 7

NOTES:
1. MOUNT LED NEAR PCB EDGE.
2. FOR ZERO ERROR AT 19,211 BAUD.
   SUBSTITUTE 2661B & 4.9152 MHZ X-TAL.
   MAX BAUD RATE WILL BECOME 38400.
3. LS157 : COMMON

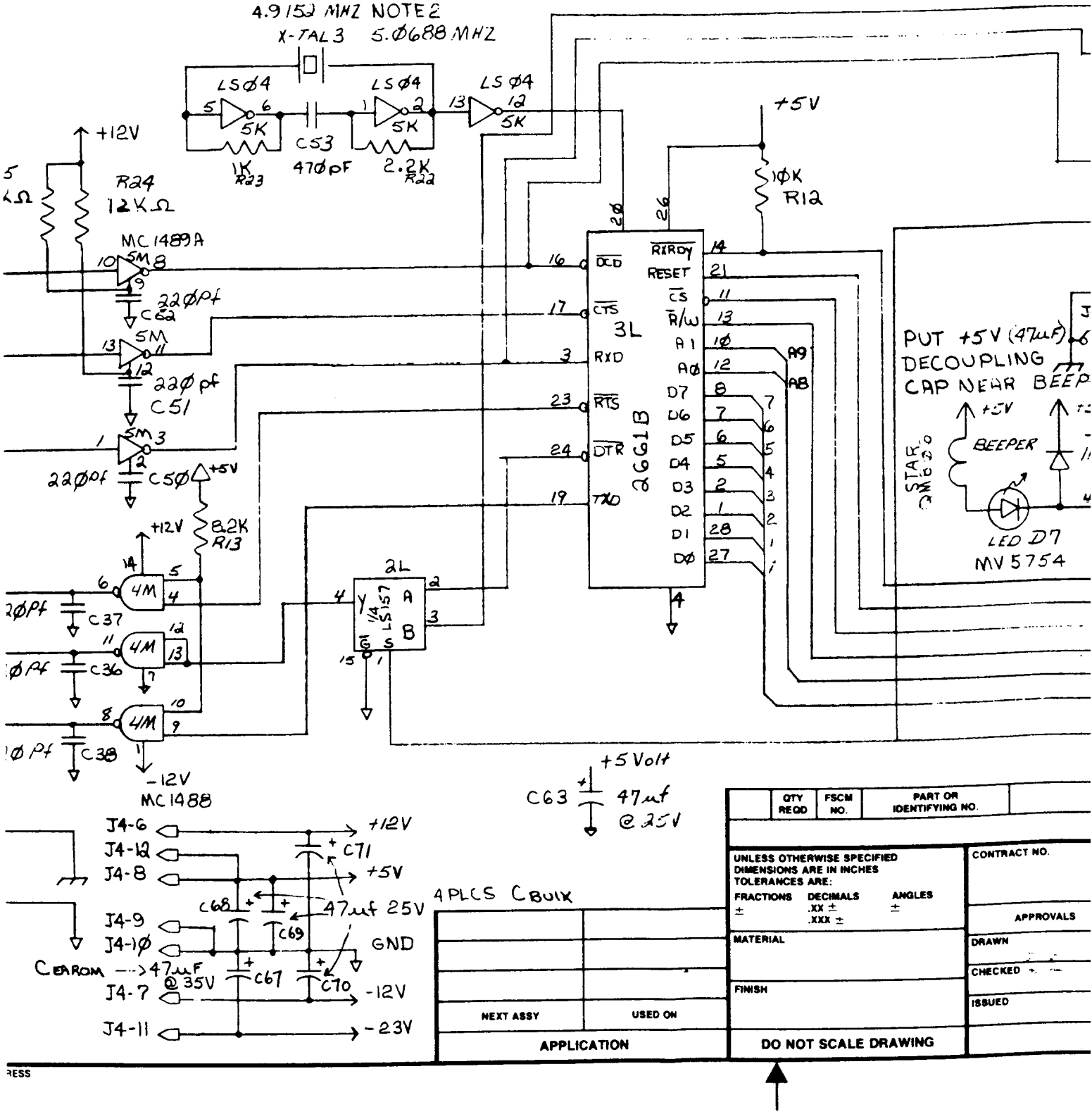


BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A19930

DWG. NO. | SH

NEAR PCB EDGE.
ERROR AT 19.2K BAUD.
TE 2661B & 4.9152 MHZ X-TAL.
RATE WILL BECOME 38400.
COMMON

J1: 25 Pin D MODEM PORT
J2: 25 Pin D PRINTER PORT



QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

NEXT ASSY | USED ON

APPLICATION

DO NOT SCALE DRAWING

CONTRACT NO.

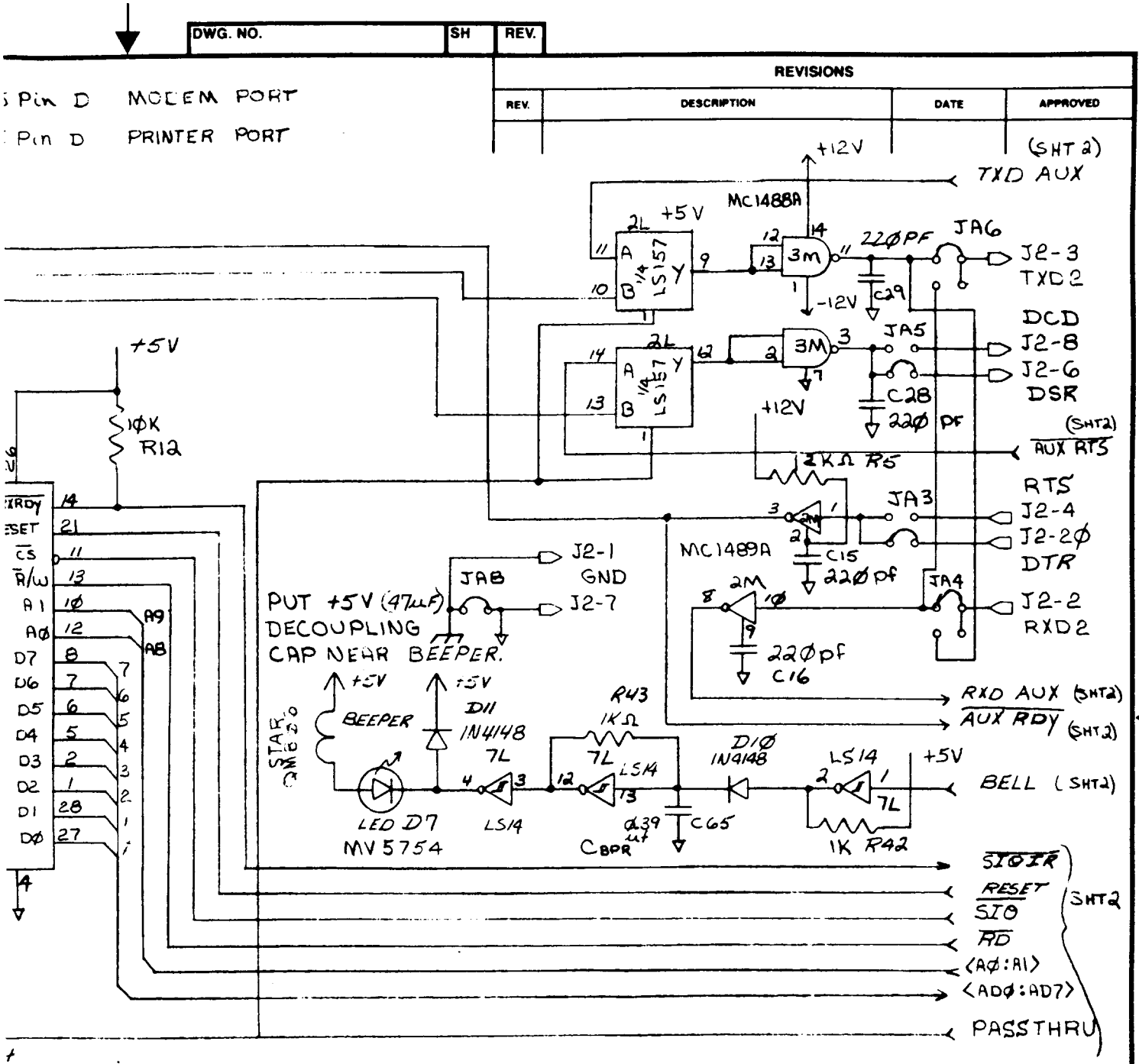
APPROVALS

DRAWN

CHECKED

ISSUED

RESS


DWG. NO.
SH
REV.
REVISIONS
REV.
DESCRIPTION
DATE
APPROVED
Pin D MODEM PORT
Pin D PRINTER PORT
+12V
TXD AUX
MC1488A
+5V
LS157
220PF
JA6
J2-3
TXD2
C29
-12V
DCD
JA5
J2-8
J2-6
DSR
C28
220 pf
(SHT2)
AUX RTS
2KΩ R5
RTS
JA3
J2-4
J2-2Ø
DTR
MC1489A
C15
220 pf
JA4
J2-2
RXD2
220pf
C16
RXD AUX (SHT2)
AUX RDY (SHT2)
+5V
10K
R12
IRDY
RESET
CS
R/W
A1
AØ
D7
D6
D5
D4
D3
D2
D1
DØ
A9
A8
J2-1
GND
JA8
J2-7
PUT +5V (47μF) DECOUPLING CAP NEAR BEEPER.
BEEPER
D11
IN4148
7L
R43
1KΩ
DIØ
IN4148
LS14
BELL (SHT2)
LED D7
MV5754
LS14
CBPR
Ø.39 μf
C65
1K R42
SIOIR
RESET
SIO
RD
<AØ:A1>
<AD0:AD7>
PASSTHRU
SHT2
QTY REQD
FSCM NO.
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
MATERIAL SPECIFICATION
PARTS LIST
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ±
DECIMALS .XX ± .XXX ±
ANGLES ±
MATERIAL
FINISH
DO NOT SCALE DRAWING
CONTRACT NO.
APPROVALS
DATE
DRAWN
CHECKED
ISSUED
WYSE TECHNOLOGY
LOGIC BOARD, WY-5Ø
SIZE B
FSCM NO.
DWG. NO. 96-Ø12-Ø1
REV. D3
SCALE
SHEET 3 of 7

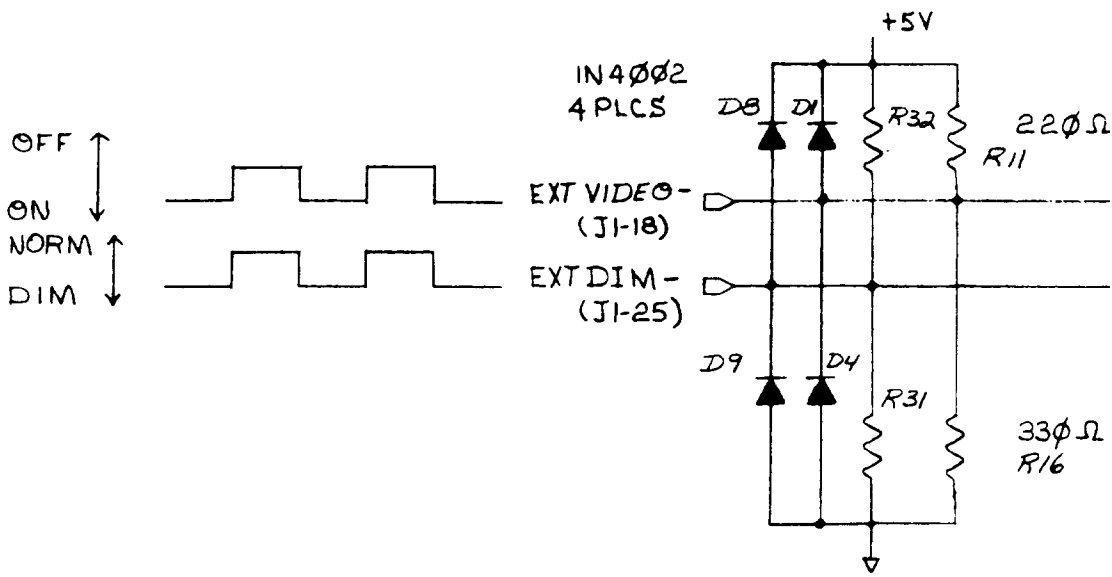
NOTES:
1. HSYNC-, VSYNC-, Require RS232C Receivers.
2. DIM-& VIDEO- Require S37 Drivers.
3. VIDEO- (J1-18) corresponds to Green-output on RGB Graphics Controller. Red-(J1-11) & Blue-(J1-19) are not used on wy-50.
4. Red-, Green-, Blue- require S37 Driver. Both transmit & receive ends of Blue-(J1-19) require diode clamps

DOT CLK (SHT 1)

GRAPHICS (SHT 2) — LS04 (9, 8, 5K)

(SHT 1) HSYNC

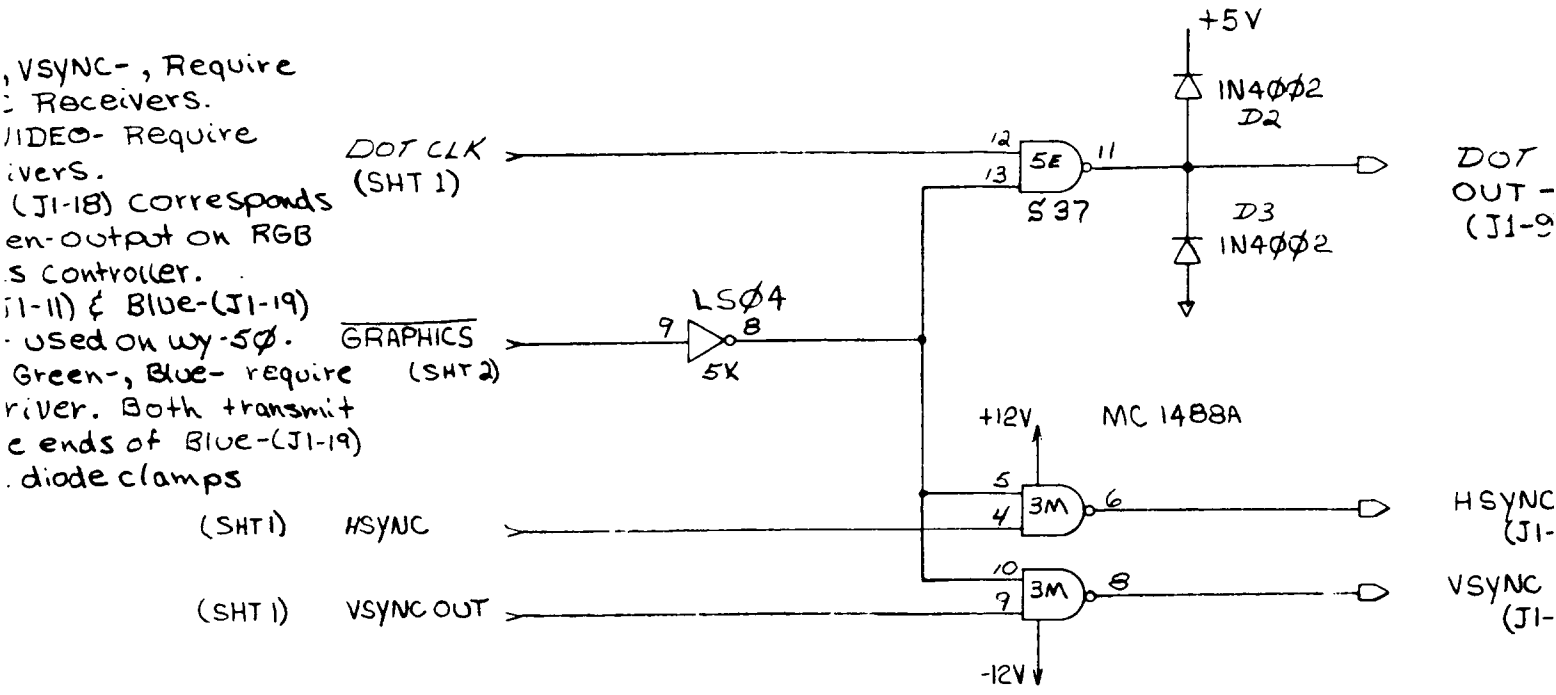
(SHT 1) VSYNC OUT

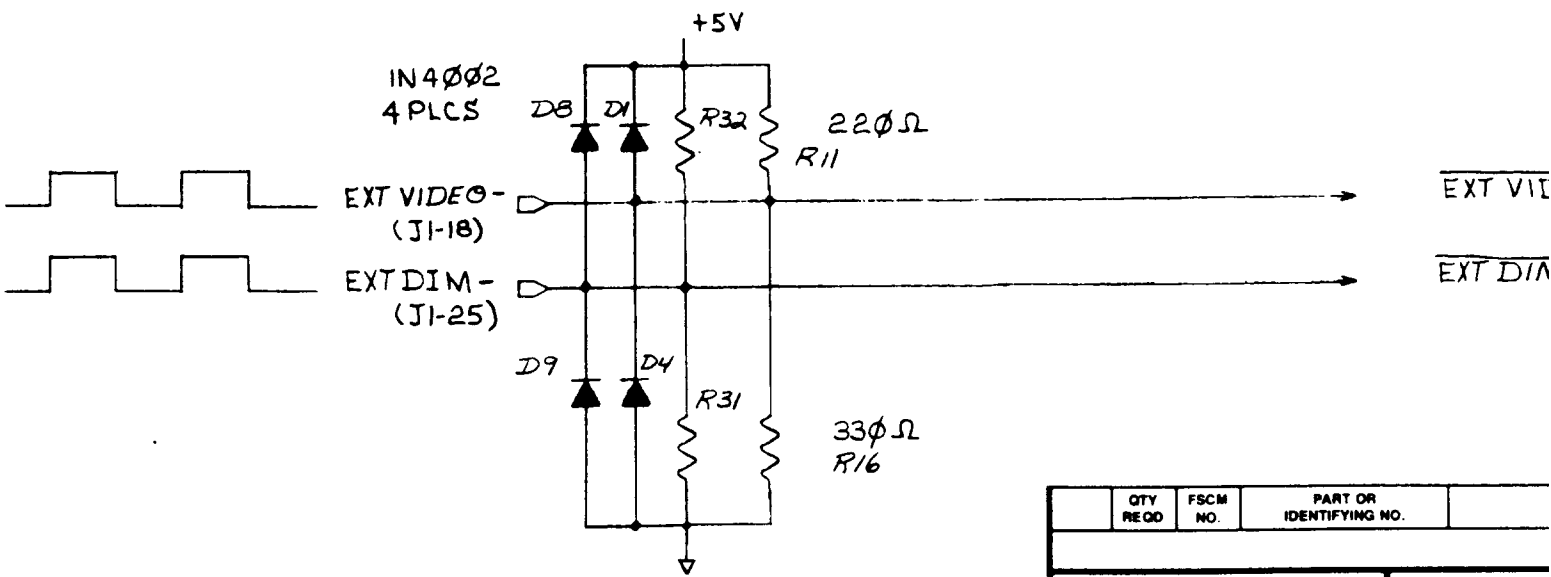


NEXT ASSY	US
APPLICATION	

DWG. NO.

, VSYNC-, Require
: Receivers.
/IDEO- Require
ivers.
(J1-18) corresponds
en-output on RGB
s Controller.
J1-11) & Blue-(J1-19)
· used on wy-50.
Green-, Blue- require
river. Both transmit
e ends of Blue-(J1-19)
. diode clamps





QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±

MATERIAL

FINISH

DO NOT SCALE DRAWING

CONTRACT NO.

APPROVALS
DRAWN
CHECKED
ISSUED

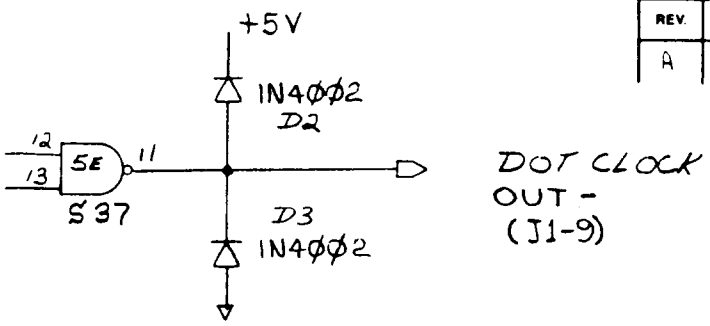
NEXT ASSY	USED ON
APPLICATION	

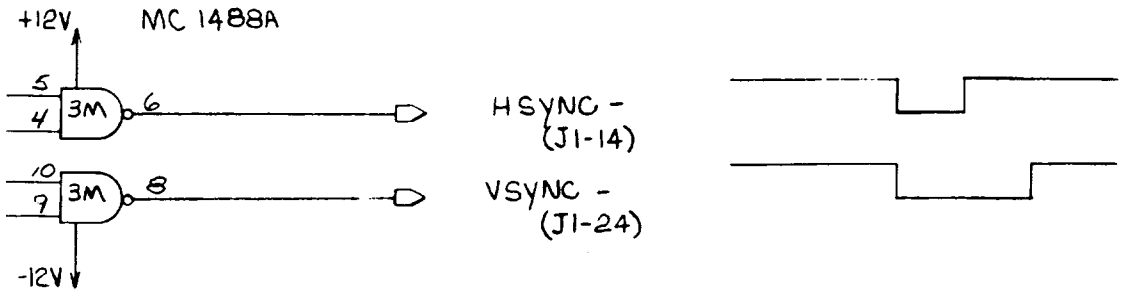
PRESS

DWG. NO.	SH	REV.

REVISIONS

REV.	DESCRIPTION	DATE	APPROVED
A	Removed Blank & CCLK. Added 1488 drivers.	1-26-89	M. Bell





→ $\overline{\text{EXT VIDEO}}$ (SHT1)

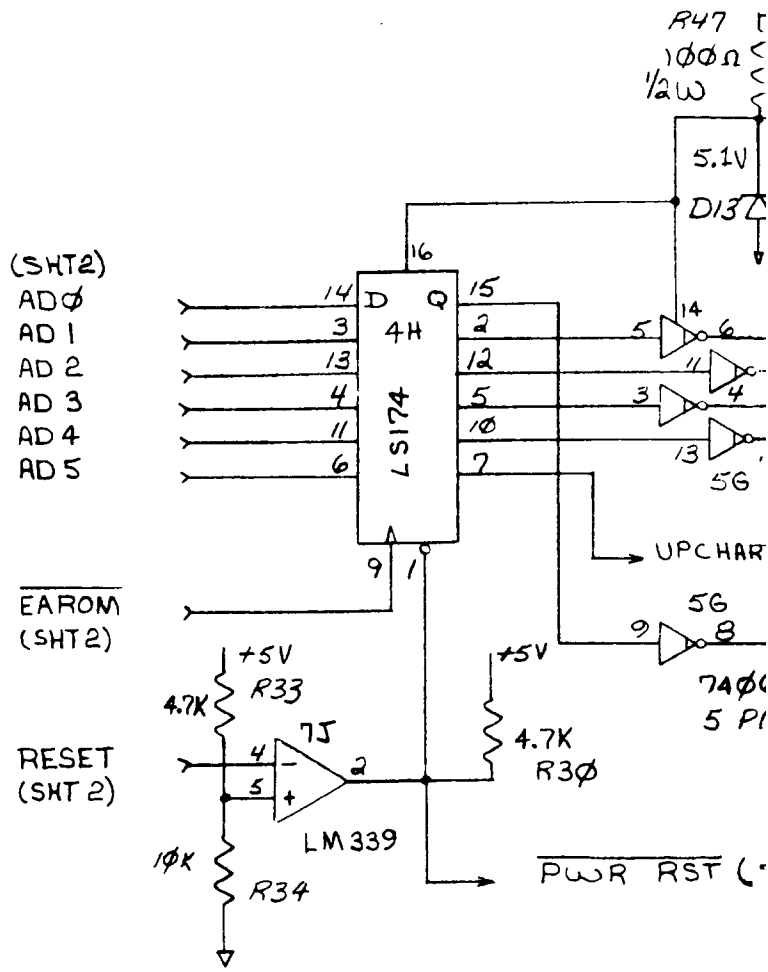
→ $\overline{\text{EXT DIM}}$ (SHT1)

GRAPHICS
INTERFACE

	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

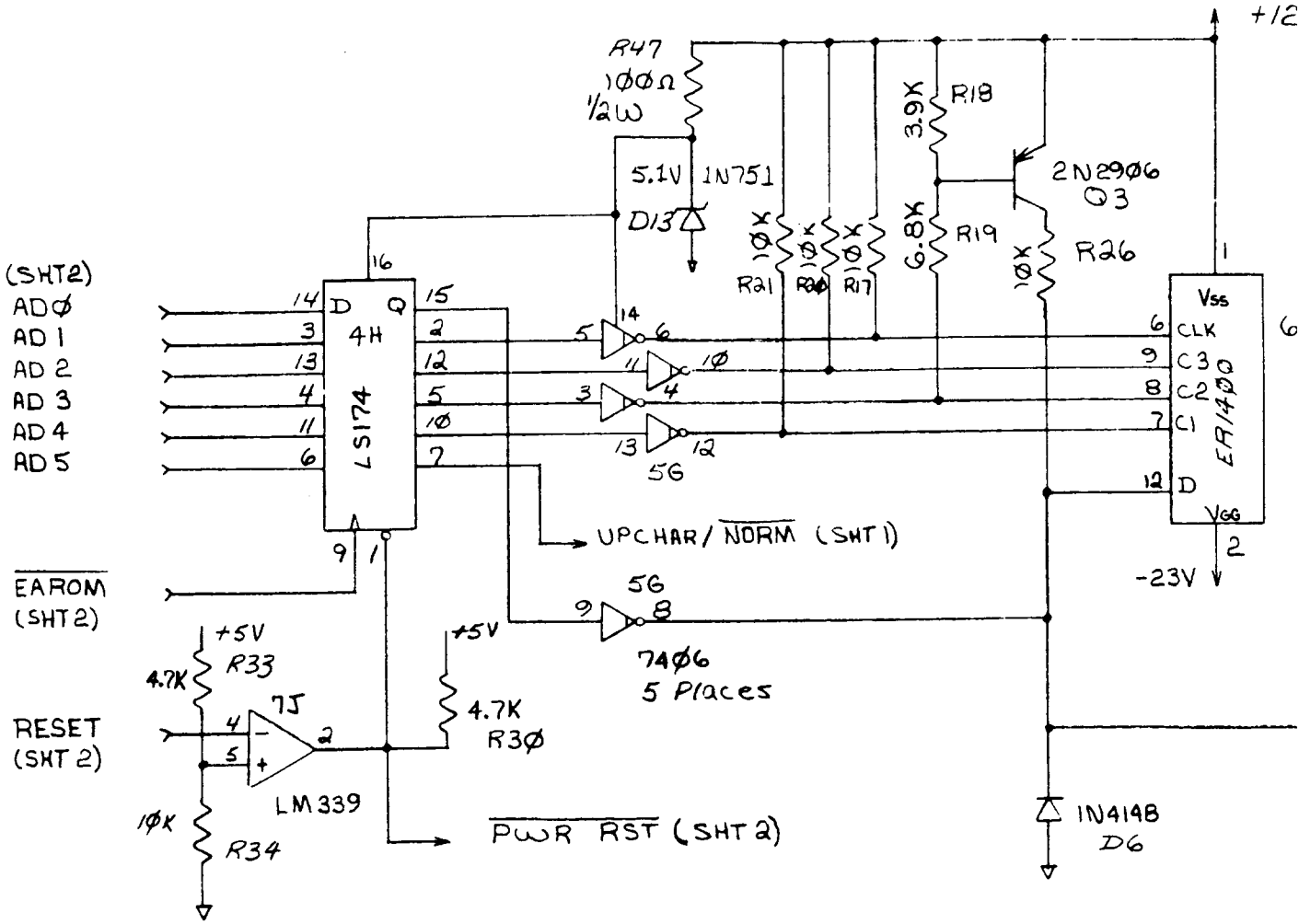
PARTS LIST

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.	WYSE TECHNOLOGY	
MATERIAL	APPROVALS / DRAWN	DATE	LOGIC BOARD, W50
FINISH	CHECKED		SIZE B / FSCM NO. / DWG. NO. 96-012-01 / REV. D3
DO NOT SCALE DRAWING	ISSUED		SCALE / SHEET 4 OF 7



NEXT ASSY	U
APPLICATION	

BISHOP GRAPHICS/ACCUPRESS
REORDER NO. A19930



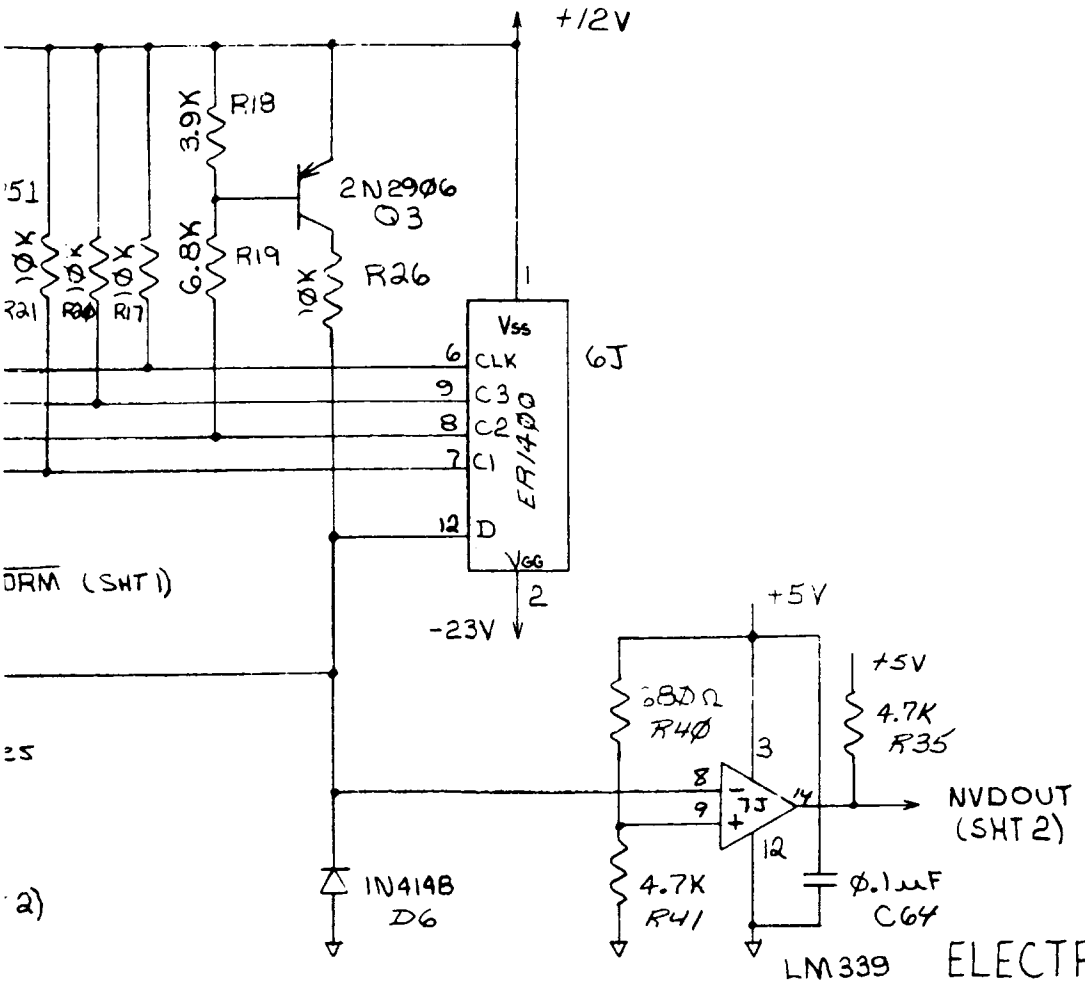
	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.
	APPROVALS
MATERIAL	DRAWN
	CHECKED
FINISH	ISSUED
DO NOT SCALE DRAWING	

NEXT ASSY	USED ON
APPLICATION	

DWG. NO.	SH	REV.

REVISIONS			
REV.	DESCRIPTION	DATE	APPROVED

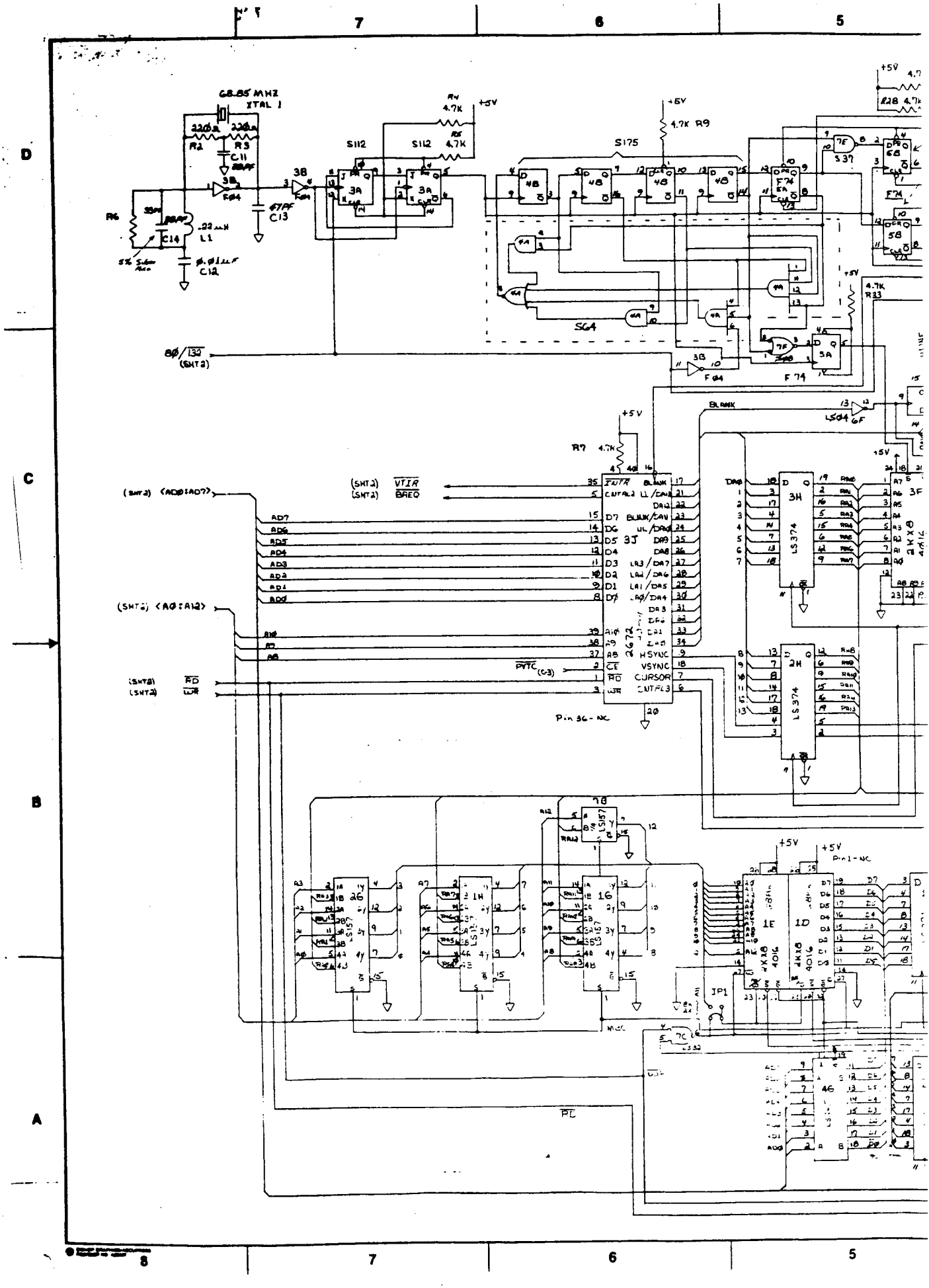


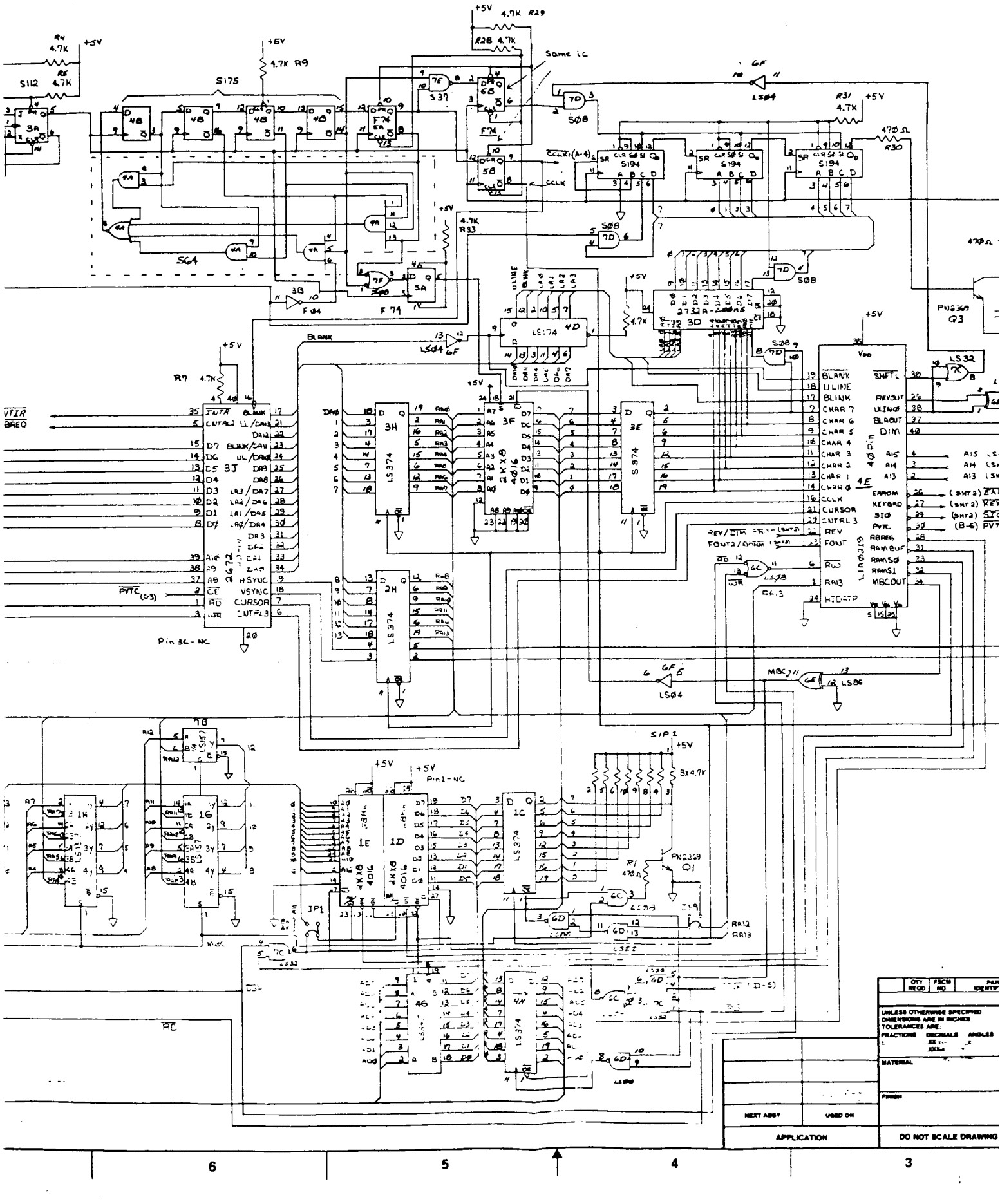
ELECTRICALLY ALTERABLE ROM
100 x 14 bit.

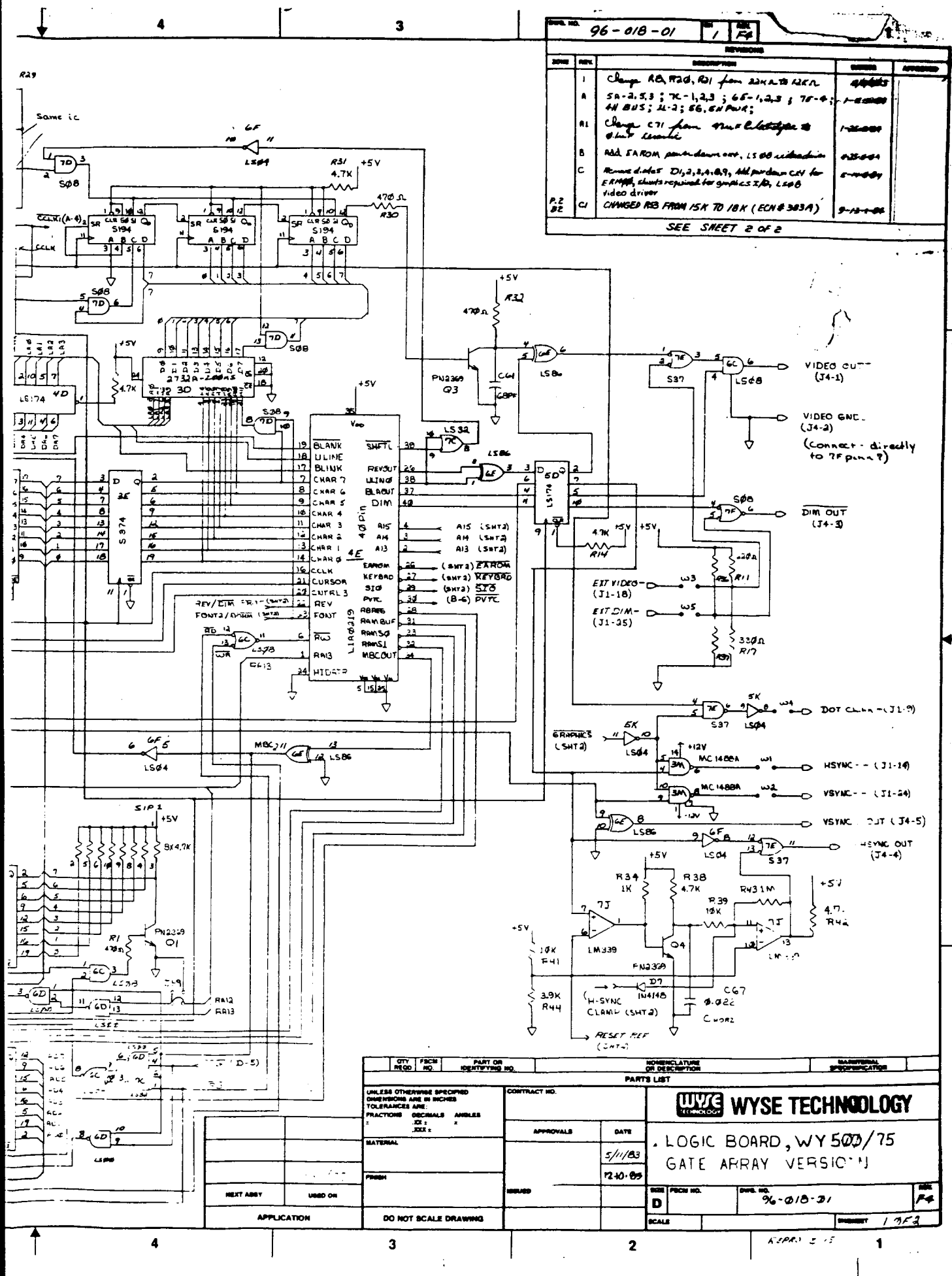
	QTY REQD	FSCM NO.	PART OR IDENTIFYING NO.	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION	

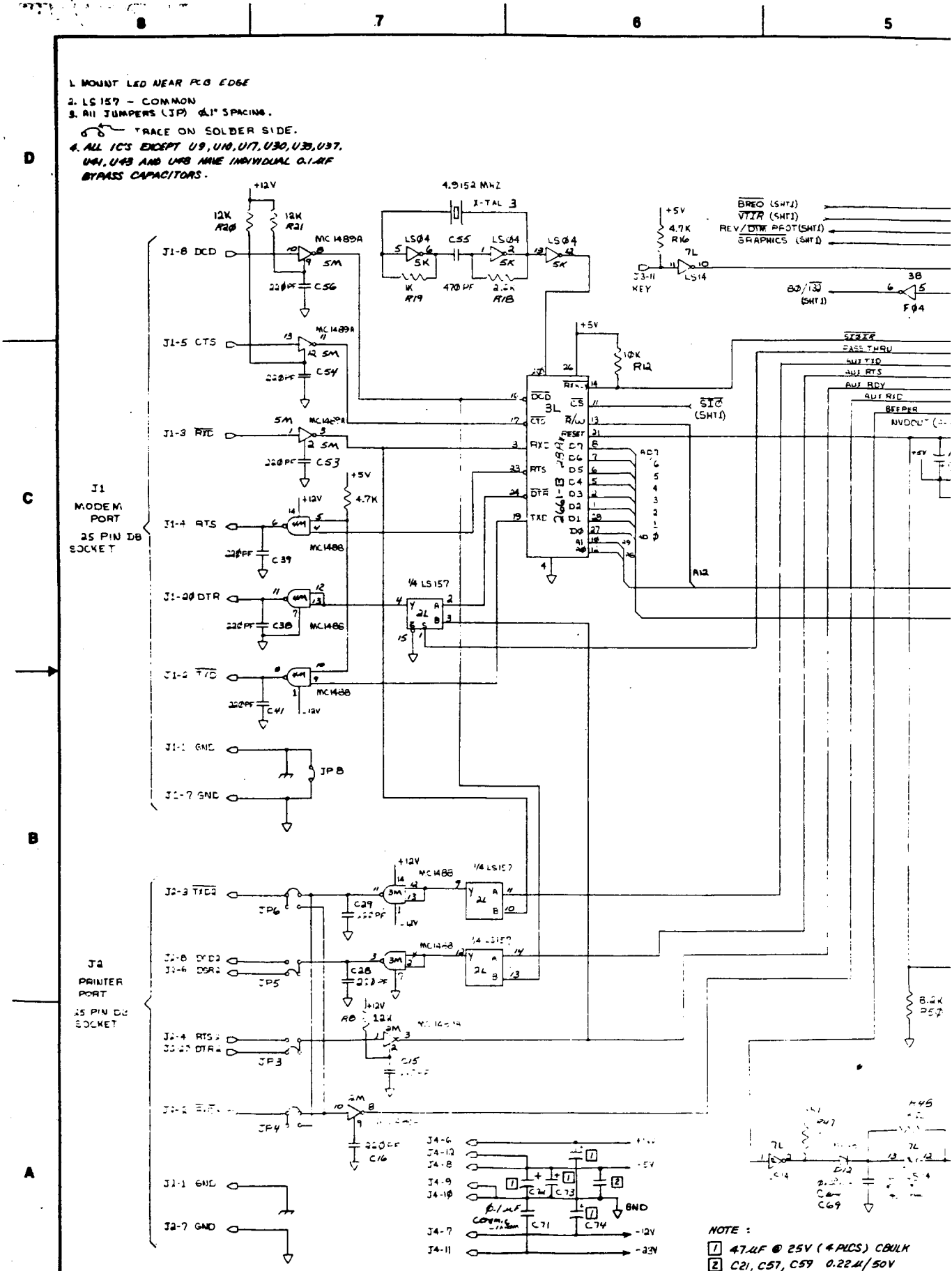
PARTS LIST

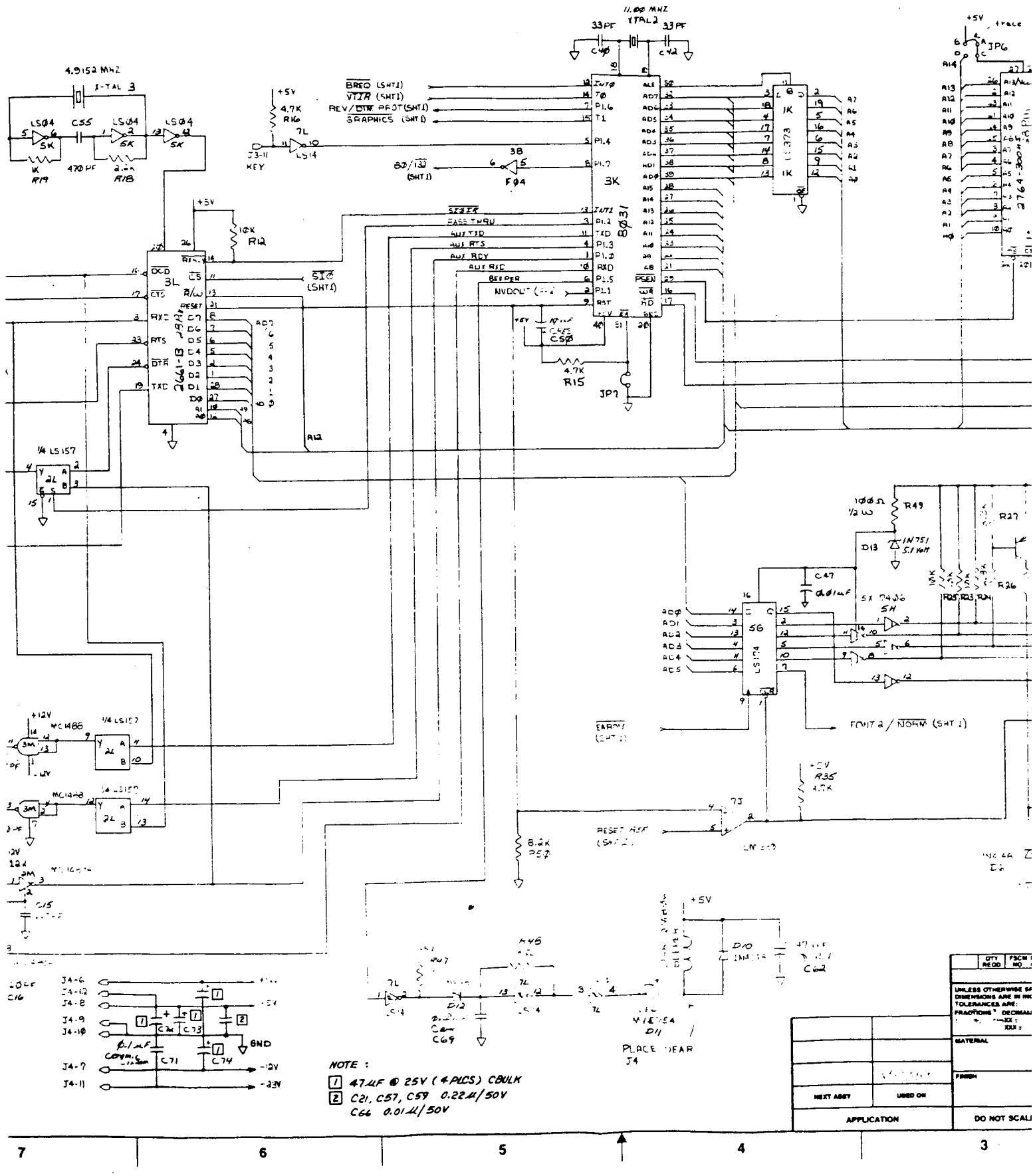
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS ± DECIMALS .XX ± .XXX ± ANGLES ±	CONTRACT NO.	WYSE TECHNOLOGY
MATERIAL	APPROVALS / DRAWN	DATE
FINISH	CHECKED	LOGIC BOARD, WY50
DO NOT SCALE DRAWING	ISSUED	SIZE B · FSCM NO. · DWG. NO. 96-012-01 · REV. D3 · SCALE · SHEET 5 OF 7

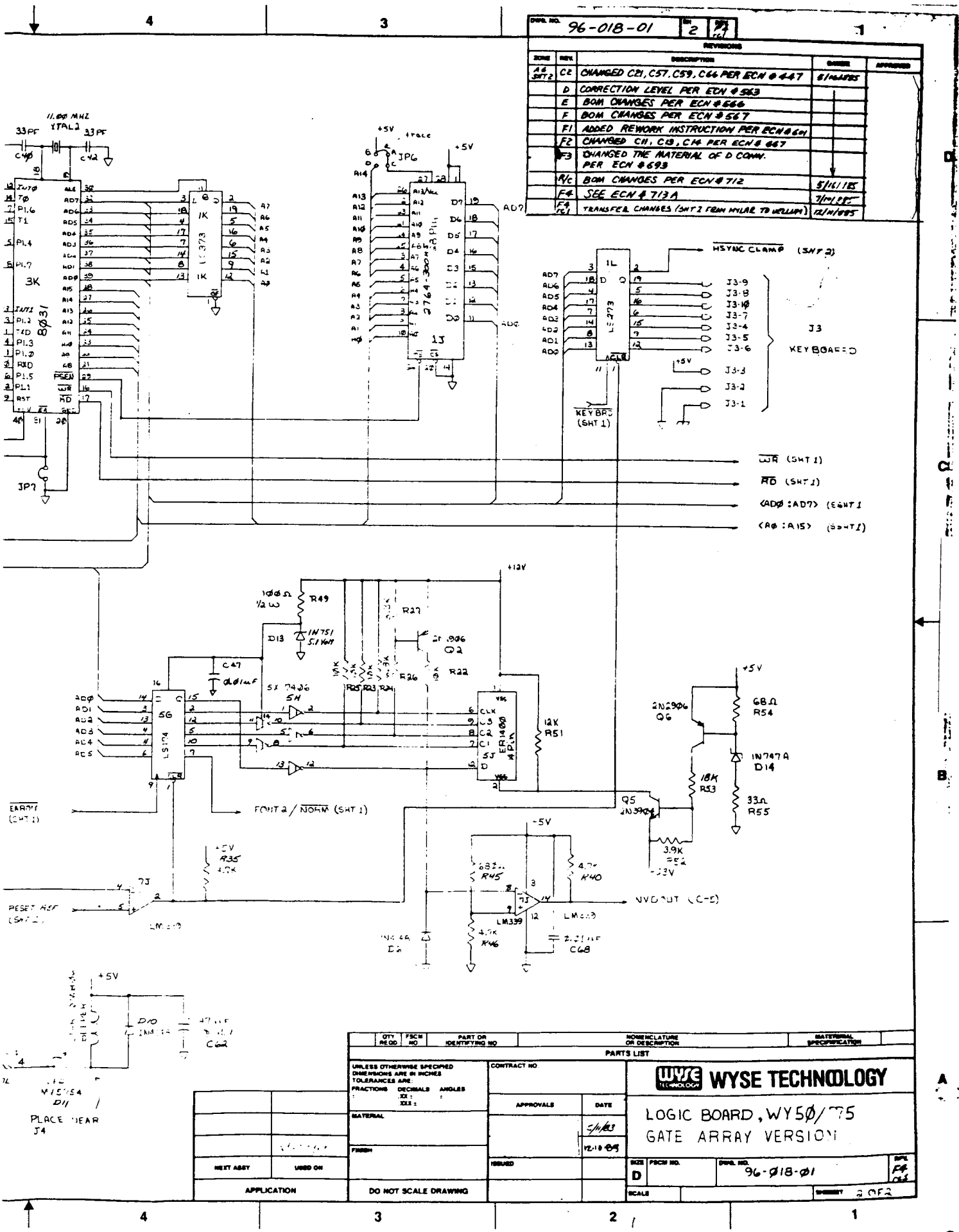

68.85 MHZ
XTAL 1
R2
R3
C11
R6
C14
L1
.22 uH
C12
C13
R4 4.7K
R5 4.7K
S112
S175
4.7K R9
R7 4.7K
R33 4.7K
+5V
SG4
F74
F04
LS04
BLANK
VTIR
BREQ
RD
WR
HSYNC
VSYNC
CURSOR
Pin 36 - NC
LS374
LS157
4016
JP1
PC
7
6
5
8

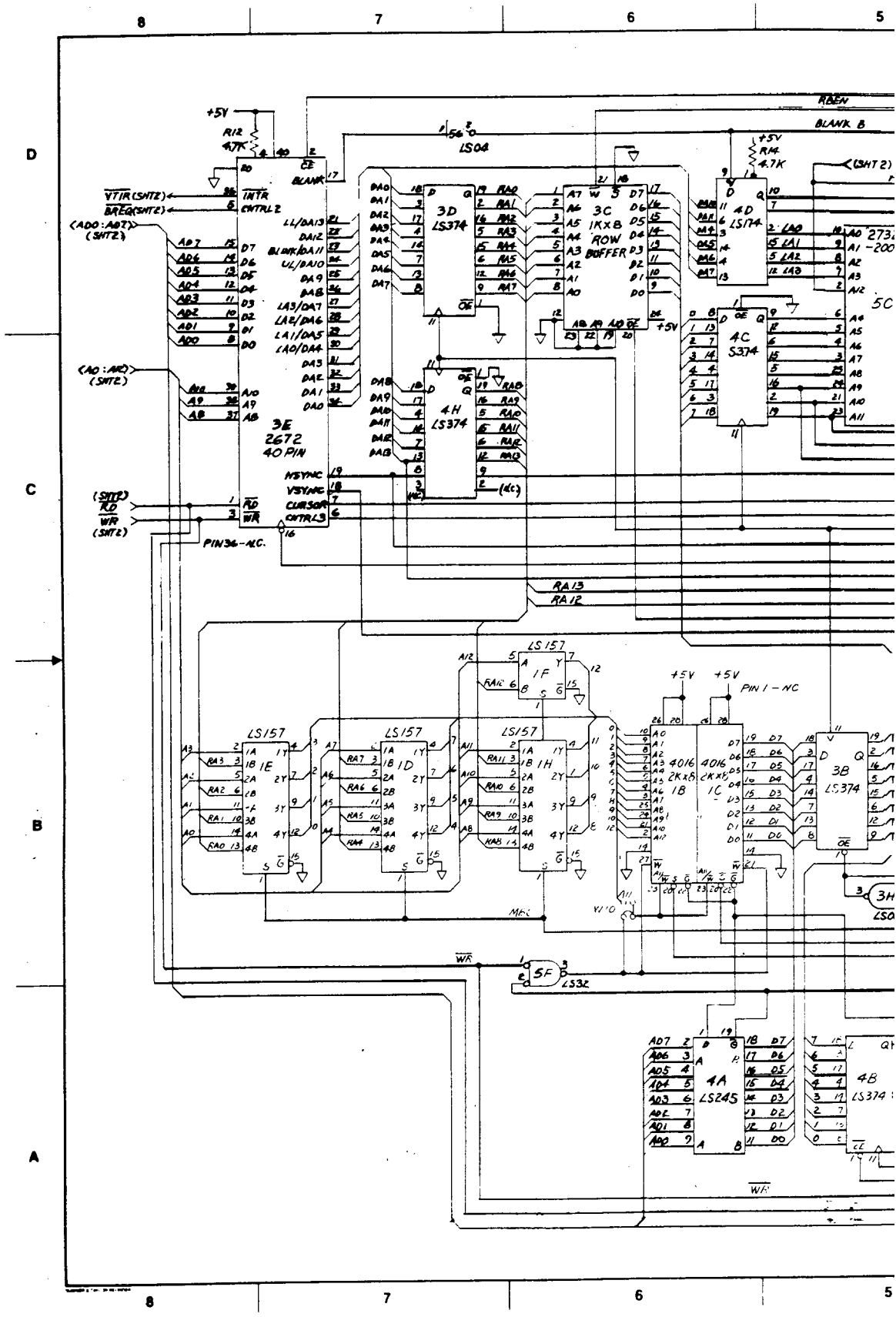

6
5
4
3
+5V
4.7K R29
R28 4.7K
Same IC
S112 4.7K
S175
4.7K R9
SG4
F74
S194
S374
LS174
2732A-200NS
PN2369 Q3
LS32
LS04
LS08
LS86
LS157
LS153
LS283
LS393
4XX8 4016
8x4.7K
PN2369 Q1
R1 470Ω
R30 470Ω
R31 4.7K
R33 4.7K
R7 4.7K
BLANK
ULINE
BLINK
CHAR 7
CHAR 6
CHAR 5
CHAR 4
CHAR 3
CHAR 2
CHAR 1
CHAR 0
CCLK
CURSOR
CNTRL 3
REV
FONT
RAM/BUF
RAMS0
RAMS1
MBCOUT
HIDATP
SHIFTL
REVOUT
ULINE
BLAOUT
DIM
EAROM
KEYBRD
SIO
PVTC
VSYNC
HSYNC
CURSOR
CNTRL3
Pin 36 - NC
Pin 1 - NC
JP1
RA12
RA13
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS
DECIMALS
ANGLES
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING

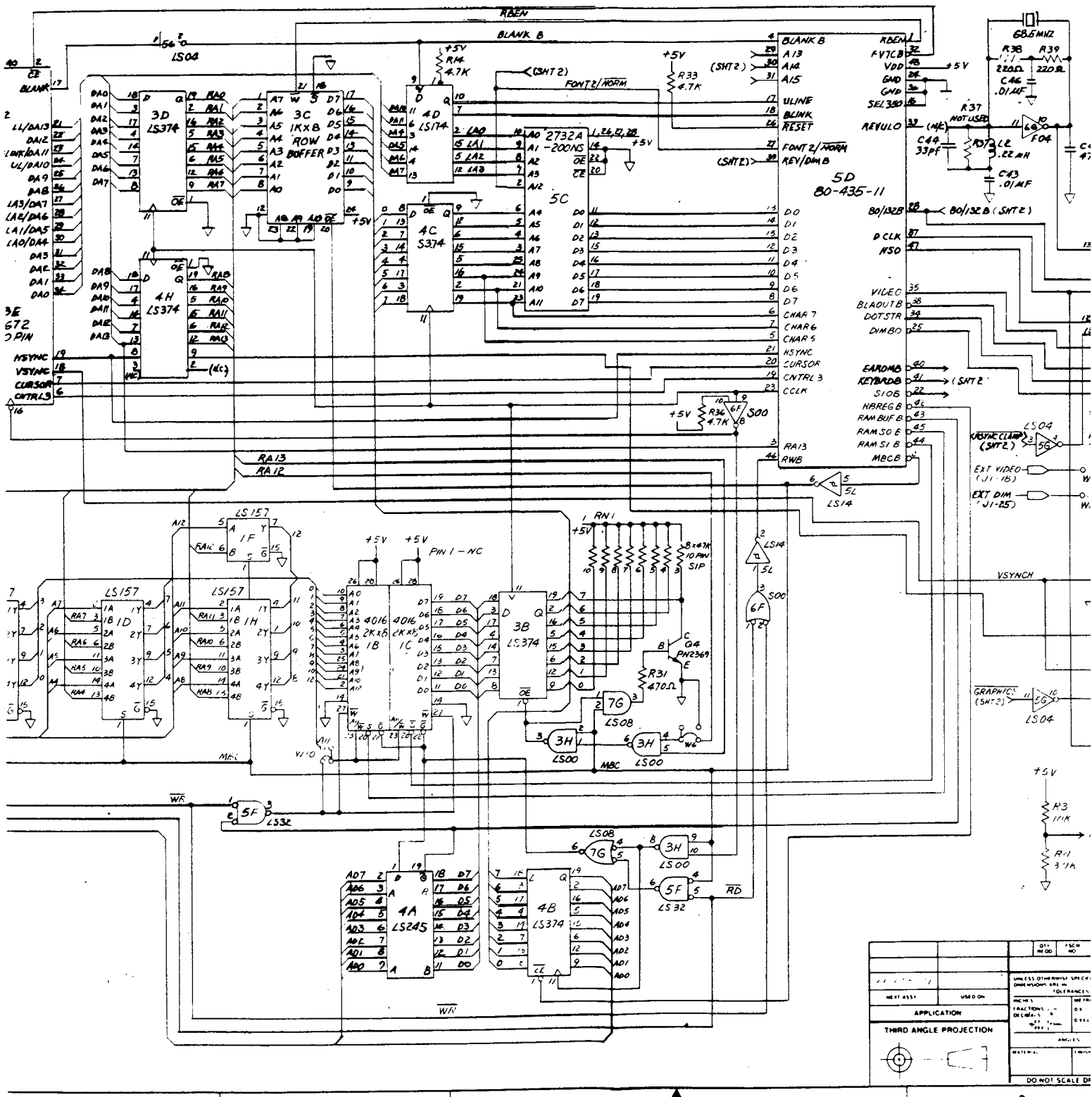

96-018-01
REVISIONS
SEE SHEET 2 OF 2
Same IC
R29
R31 +5V 4.7K
470Ω R30
CCLK(A-6)
CCLK
S194
S08
LS174
4.7K
2732A-25
+5V
R32
470Ω
PN2369 Q3
CG1
68PF
LS86
LS32
LS04
LS08
S37
VIDEO OUT (J4-1)
VIDEO GND (J4-2)
(Connect directly to 7F pin 7)
DIM OUT (J4-3)
BLANK
ULINE
BLINK
CHAR 7
CHAR 6
CHAR 5
CHAR 4
CHAR 3
CHAR 2
CHAR 1
CHAR 0
CCLK
CURSOR
CNTRL 3
REV
FONT
RA13
HIDATA
SHFTL
REVOUT
ULINO
BLAOUT
DIM
40 Pin
A15 (SHT3)
A14 (SHT3)
A13 (SHT3)
EAROM
KEYBRD
SIO
PVTC
ABREG
RAMBUF
RAMSO
RAMSL
MBCOUT
S374
LS378
LS174
4.7K R14
+20Ω R11
330Ω R17
EXT VIDEO (J1-18)
EXT DIM (J1-35)
DOT CLK (J1-9)
GRAPHICS (SHT2)
MC1488A
MC1488
HSYNC (J1-14)
VSYNC (J1-24)
VSYNC OUT (J4-5)
HSYNC OUT (J4-4)
SIP 1
8x4.7K
R1 470Ω
PN2369 Q1
R34 1K
R38 4.7K
R39 10K
RV1M
4.7K R42
LM339
Q4
PN2369
10K R41
3.9K R44
IN4148 D7
CG7 .022
H-SYNC CLAMP (SHT2)
RESET REF (SHT2)
PARTS LIST
QTY REQD
FSCM NO.
PART OR IDENTIFYING NO.
NOMENCLATURE OR DESCRIPTION
MATERIAL SPECIFICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES TOLERANCES ARE: FRACTIONS DECIMALS ANGLES .XX ± .XXX ±
CONTRACT NO.
APPROVALS
DATE
5/11/83
12-10-83
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE DRAWING
WYSE TECHNOLOGY
LOGIC BOARD, WY500/75
GATE ARRAY VERSION
SIZE D
FSCM NO.
DWG. NO. 96-018-01
REV F4
SCALE
SHEET 1 OF 2

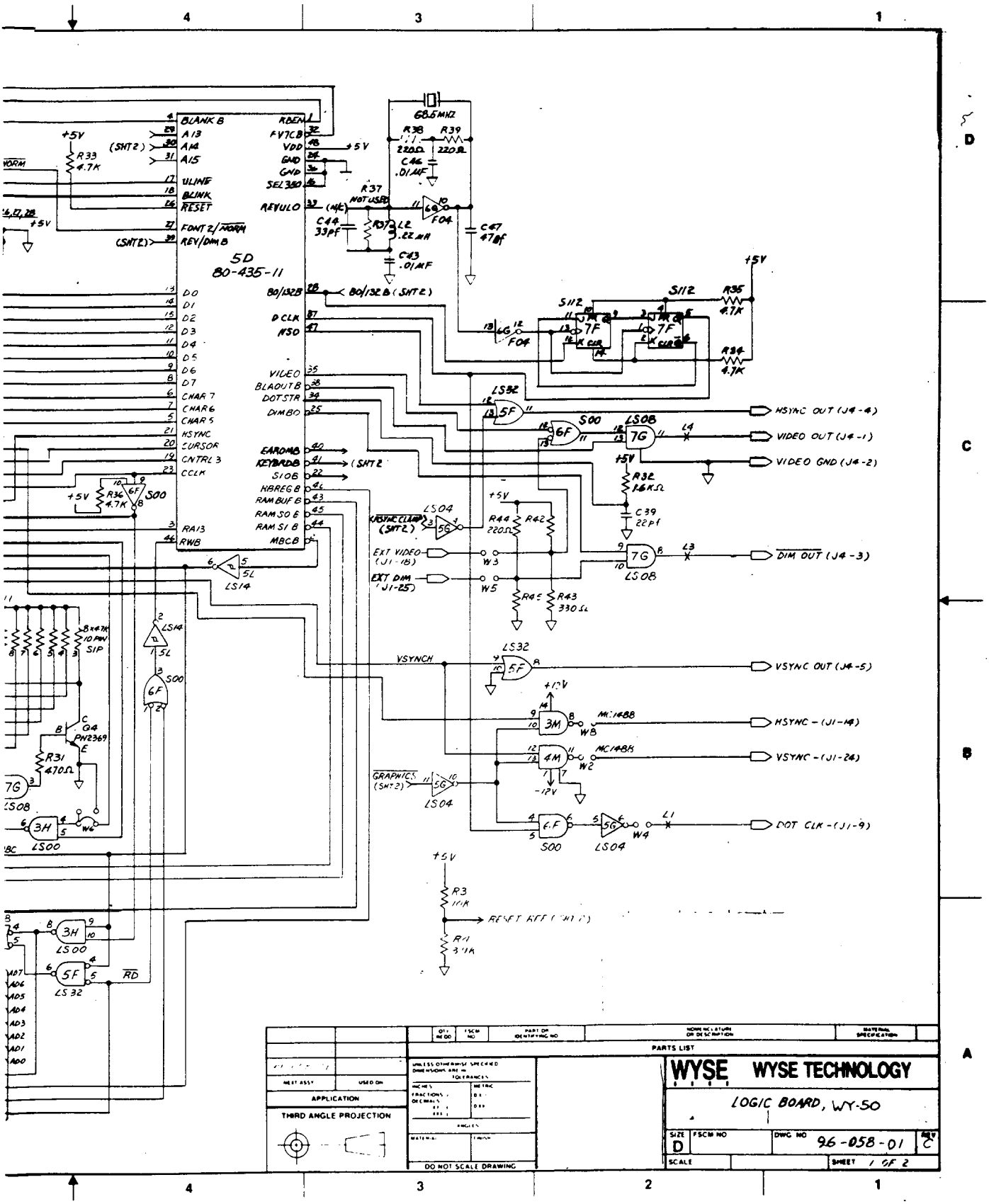

1. MOUNT LED NEAR PCB EDGE
2. LS 157 – COMMON
3. All JUMPERS (JP) .1" SPACING.
TRACE ON SOLDER SIDE.
4. ALL IC'S EXCEPT U9, U10, U17, U30, U35, U37, U41, U43 AND U48 HAVE INDIVIDUAL 0.1 uF BYPASS CAPACITORS.
J1 MODEM PORT 25 PIN DB SOCKET
J2 PRINTER PORT 25 PIN DB SOCKET
+12V
+5V
-12V
GND
4.9152 MHz
X-TAL 3
MC1489A
MC1488
1/4 LS157
2661-3
JP8
JP6
JP5
JP3
JP4
NOTE :
1 47 uF @ 25V (4 PLCS) CBULK
2 C21, C57, C59 0.22 u/50V
C66 0.01 u/50V

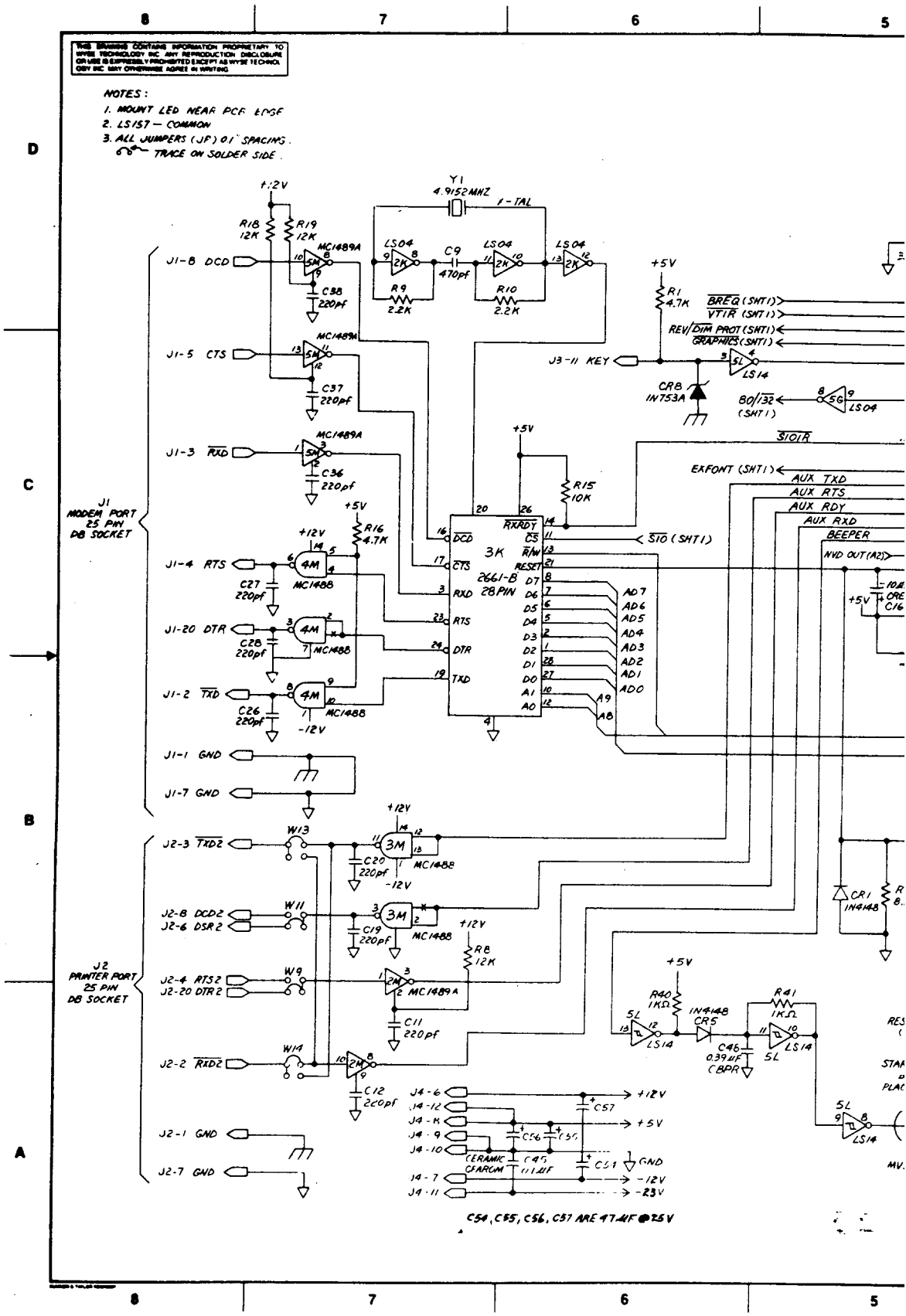

4.9152 MHZ
X-TAL 3
LS04
C55
470 PF
R19
R18
11.000 MHZ
XTAL2
33PF
C40
C42
+5V
4.7K
R16
KEY
BRED (SHT1)
VTIR (SHT1)
REV/DTR RQST(SHT1)
GRAPHICS (SHT1)
80/130 (SHT1)
8031
3K
1K
R12
SIO (SHT1)
2661-B
ADT
1/4 LS157
MC1488
MC1489
+12V
-12V
-5V
+5V
R49
1N751
5.1 VOLT
D13
C47
0.01uF
5X 7406
LS174
FONT2/NORM (SHT1)
R35
4.7K
8.2K
R57
RESET HSF
(SHT1)
D10
1N4148
C62
C69
D11
PLACE NEAR J4
J4-6
J4-12
J4-8
J4-9
J4-10
J4-7
J4-11
C16
C73
C71
C74
0.1uF
CERAMIC
GND
-12V
-23V
NOTE :
1 47uF @ 25V (4 PLCS) CBULK
2 C21, C57, C59 0.22u/50V
C66 0.01u/50V
UNLESS OTHERWISE SP
DIMENSIONS ARE IN INC
TOLERANCES ARE:
FRACTIONS DECIMAL
MATERIAL
FINISH
NEXT ASSY
USED ON
APPLICATION
DO NOT SCALE

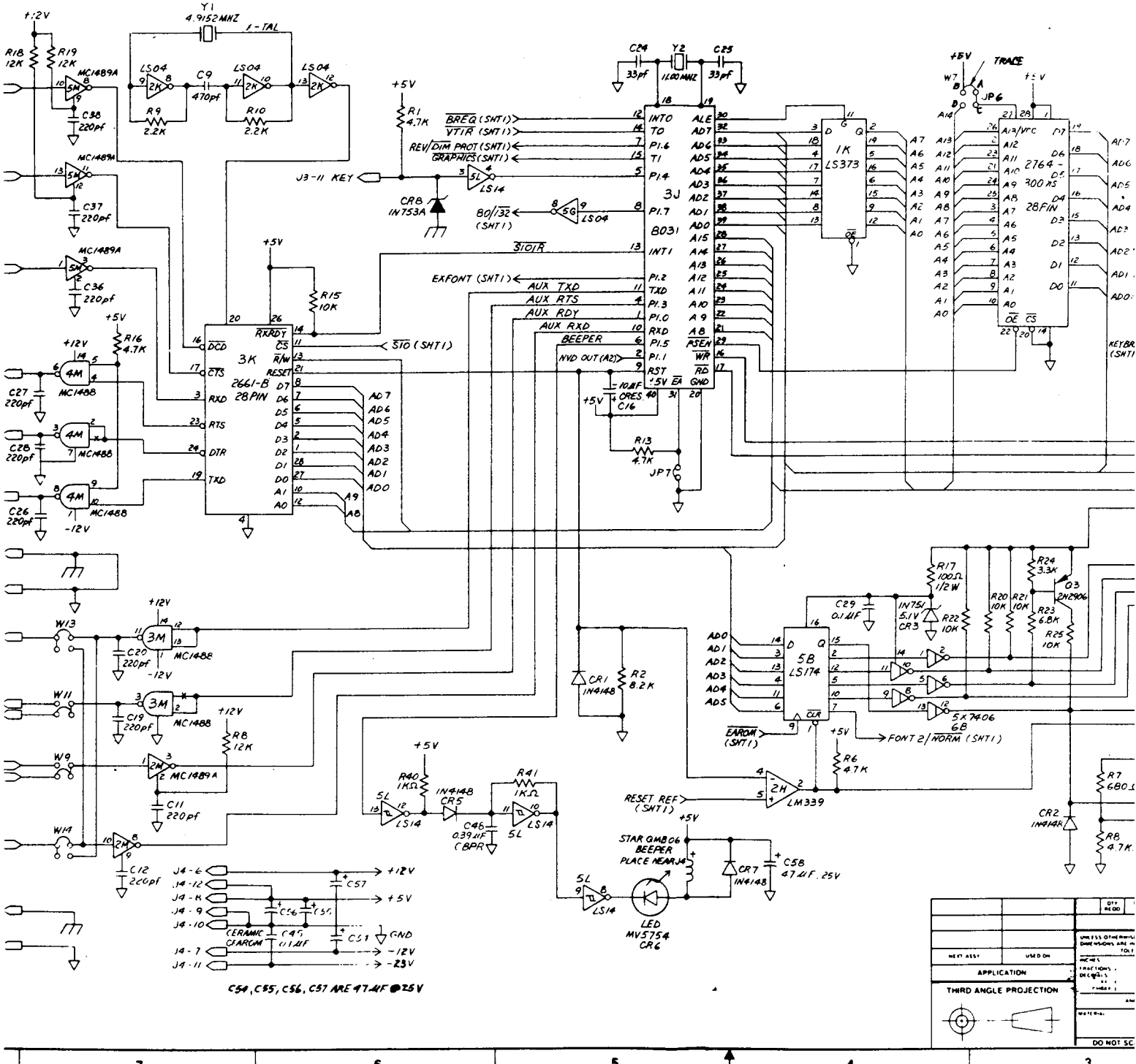

DWG. NO. 96-018-01
REVISIONS
ZONE | REV. | DESCRIPTION | DATE | APPROVED
A6 SHT 2 | C2 | CHANGED C21, C57, C59, C66 PER ECN # 447 | 8/16/85
D | CORRECTION LEVEL PER ECN # 563
E | BOM CHANGES PER ECN # 666
F | BOM CHANGES PER ECN # 567
F1 | ADDED REWORK INSTRUCTION PER ECN # 671
F2 | CHANGED C11, C13, C14 PER ECN # 667
F3 | CHANGED THE MATERIAL OF D CONN. PER ECN # 693
R/C | BOM CHANGES PER ECN # 712 | 5/16/85
F4 | SEE ECN # 713A | 7/19/85
F4 TC1 | TRANSFER CHANGES (SHT 2 FROM MYLAR TO VELLUM) | 12/11/85
11.060 MHZ XTAL2
33PF
C40
C42
8031
3K
1K
74LS373
2764-300NS
1J
JP6
JP7
+5V trace
AD7
AD0
HSYNC CLAMP (SHT 2)
74LS273
1L
J3-9
J3-8
J3-10
J3-7
J3-4
J3-5
J3-6
J3-3
J3-2
J3-1
J3
KEYBOARD
KEYBRD (SHT 1)
WR (SHT 1)
RD (SHT 1)
<AD0:AD7> (SHT 1)
<A0:A15> (SHT 1)
+12V
100Ω 1/2 W
R49
IN751 5.1 Volt
D13
C47
0.01mF
R27
2N3906 Q2
R26
R22
R25 R23 R24
74LS04 5H
74LS04 5G
ERI4008 4PLN 5J
12K R51
2N2906 Q6
68Ω R54
IN747A D14
18K R53
33Ω R55
Q5 2N3904
3.9K R52
-33V
EARPF (SHT 1)
FONT 2 / NORM (SHT 1)
+5V R35 4.7K
7J
PRESET REF (SHT 2)
LM339
-5V
680Ω R45
4.7K R40
4.7K R46
2.2 mF C68
NVDOUT (C-5)
+5V
D10 IN4148
C62
MIC/SP
D11
PLACE NEAR J4
PARTS LIST
QTY REQD | FSCM NO | PART OR IDENTIFYING NO | NOMENCLATURE OR DESCRIPTION | MATERIAL SPECIFICATION
UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES
TOLERANCES ARE:
FRACTIONS DECIMALS ANGLES
.XX ±
.XXX ±
CONTRACT NO
APPROVALS | DATE
MATERIAL
FINISH
ISSUED
NEXT ASSY | USED ON
APPLICATION
DO NOT SCALE DRAWING
WYSE TECHNOLOGY
LOGIC BOARD, WY50/75
GATE ARRAY VERSION
SIZE D | FSCM NO | DWG. NO. 96-018-01 | REV F4 TC1
SCALE | SHEET 2 OF 2

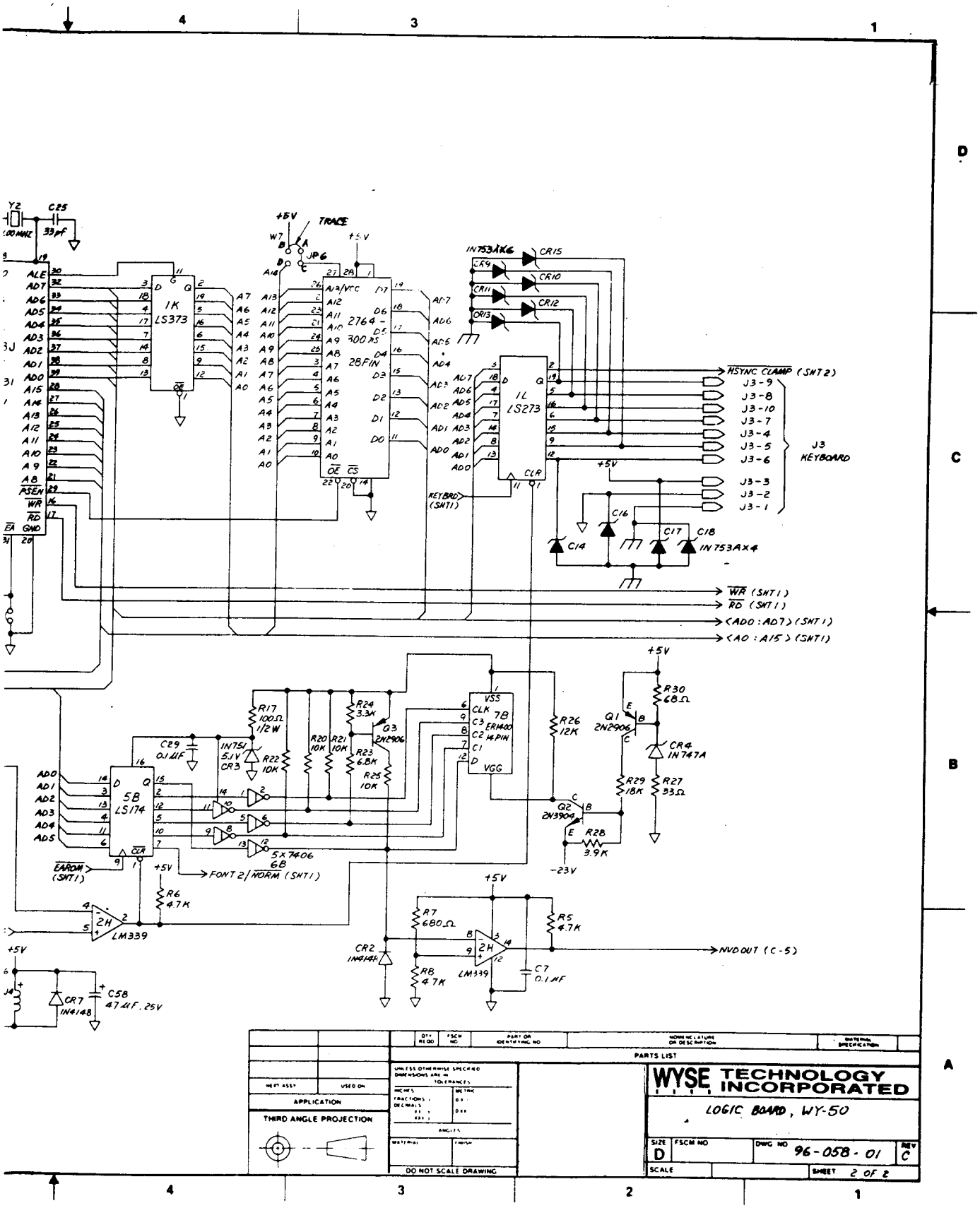

8
7
6
5
D
C
B
A
+5V
R12
4.7K
LS04
BLANK B
RBEN
3E
2672
40 PIN
3D
LS374
3C
1KXB
ROW
BUFFER
4D
LS374
4C
S374
4H
LS374
5C
PIN36-NC.
RA13
RA12
LS157
1F
1E
1D
1H
1B
4016
2KXB
1C
4016
CKXB
3B
LS374
5F
LS32
4A
LS245
4B
LS374
WR
MAC

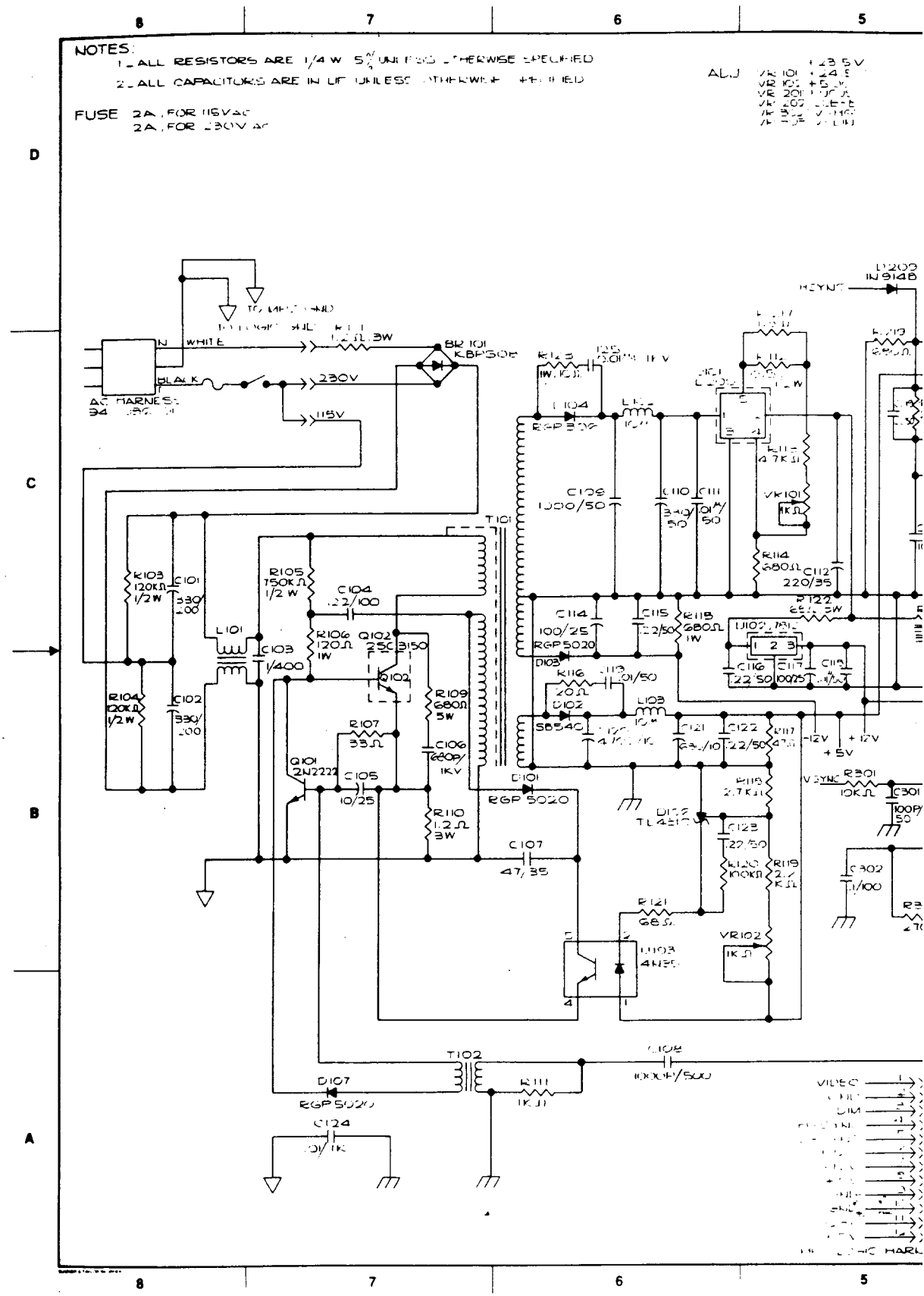

RBEN
BLANK B
LS08
3D LS374
3C 1KX8 ROW BUFFER
4D LS174
4C S374
4H LS374
5C 2732A -200NS
5D 80-435-11
68.5MHZ
R38 220Ω
R39 220Ω
C46 .01MF
R37 NOT USED
C44 33pF
R32
L2 .22mH
C43 .01MF
F04
FONT2/NORM
REV/DMB
REVULO
B0/132B
DCLK
HSO
VIDEO
BLAOUTB
DOTSTR
DIMBO
EAROMB
KEYBRDB
SIOB
HBREGB
RAMBUFB
RAMSOB
RAMSIB
MBCB
RA13
RA12
RWB
LS157
1F
1D
1H
4016 2KX8 1B
4016 2KX8 1C
PIN 1 - NC
RN1
8X47K 10 PIN SIP
3B LS374
Q4 PN2369
R31 470Ω
LS08
LS00
LS14
LS04
VSYNCH
GRAPHICS (SHT3)
EXT VIDEO (J1-15)
EXT DIM (J1-25)
HSYNC CLAMP (SHT2)
MBC
WR
5F LS32
4A LS245
4B LS374
RD
R3 1.11K
R1 3.1K
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DR

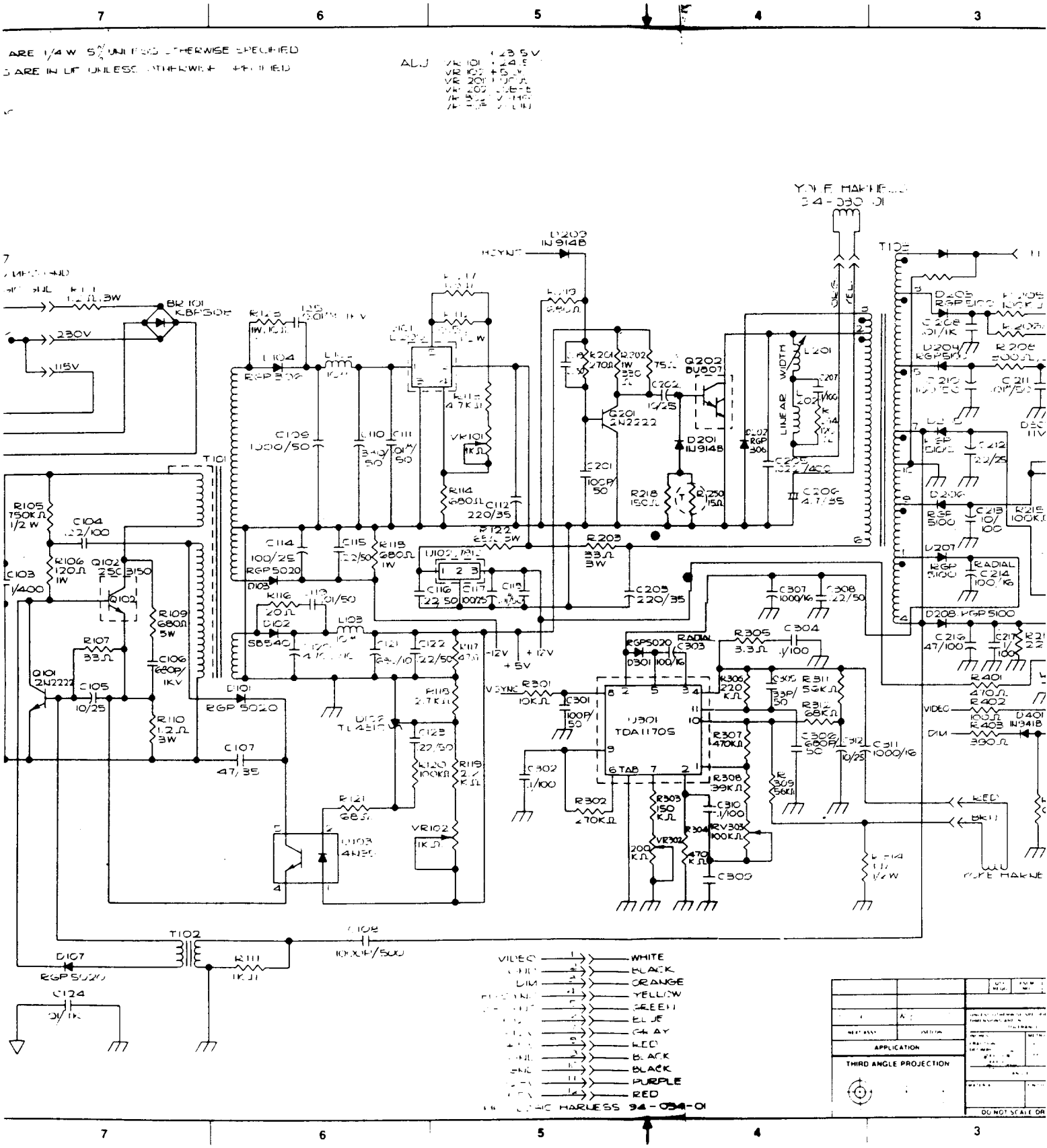

5D
80-435-11
68.5MHZ
R38 220Ω
R39 220Ω
C46 .01μF
R37 NOT USED
C48 33pF
L2 3.22μH
C43 .01μF
C47 47pf
FO4
S112
R35 4.7K
R34 4.7K
LS32
LS00
LS08
LS04
LS14
LS02
R32 1.6KΩ
C39 22pf
R44 220Ω
R42
R45
R43 330Ω
R36 4.7K
R31 470Ω
Q4 PN2369
8x4.7K 10 PIN SIP
R3 11K
R1 3.1K
+5V
+12V
-12V
HSYNC OUT (J4-4)
VIDEO OUT (J4-1)
VIDEO GND (J4-2)
DIM OUT (J4-3)
VSYNC OUT (J4-5)
HSYNC - (J1-14)
VSYNC - (J1-24)
DOT CLK - (J1-9)
RESET REF (SHT 1)
EXT VIDEO (J1-15)
EXT DIM (J1-25)
MC1488
MC1488
BLANK B
A13
A14
A15
ULINE
BLINK
RESET
FONT 2/NORM
REV/DIM B
D0
D1
D2
D3
D4
D5
D6
D7
CHAR 7
CHAR 6
CHAR 5
HSYNC
CURSOR
CNTRL 3
CCLK
RA13
RWB
RDEN
FVTCB
VDD
GND
GND
SEL350
REVULO
80/132B
DCLK
NSO
VIDEO
BLAOUTB
DOTSTR
DIMBO
EAROMB
KEYBRDB
SIOB
KBREGB
RAMBUFB
RAMSOB
RAMSIB
MBCB
RD
WR
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
WYSE TECHNOLOGY
LOGIC BOARD, WY-50
SIZE D
DWG NO 96-058-01
REV C
SCALE
SHEET 1 OF 2
PARTS LIST
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING

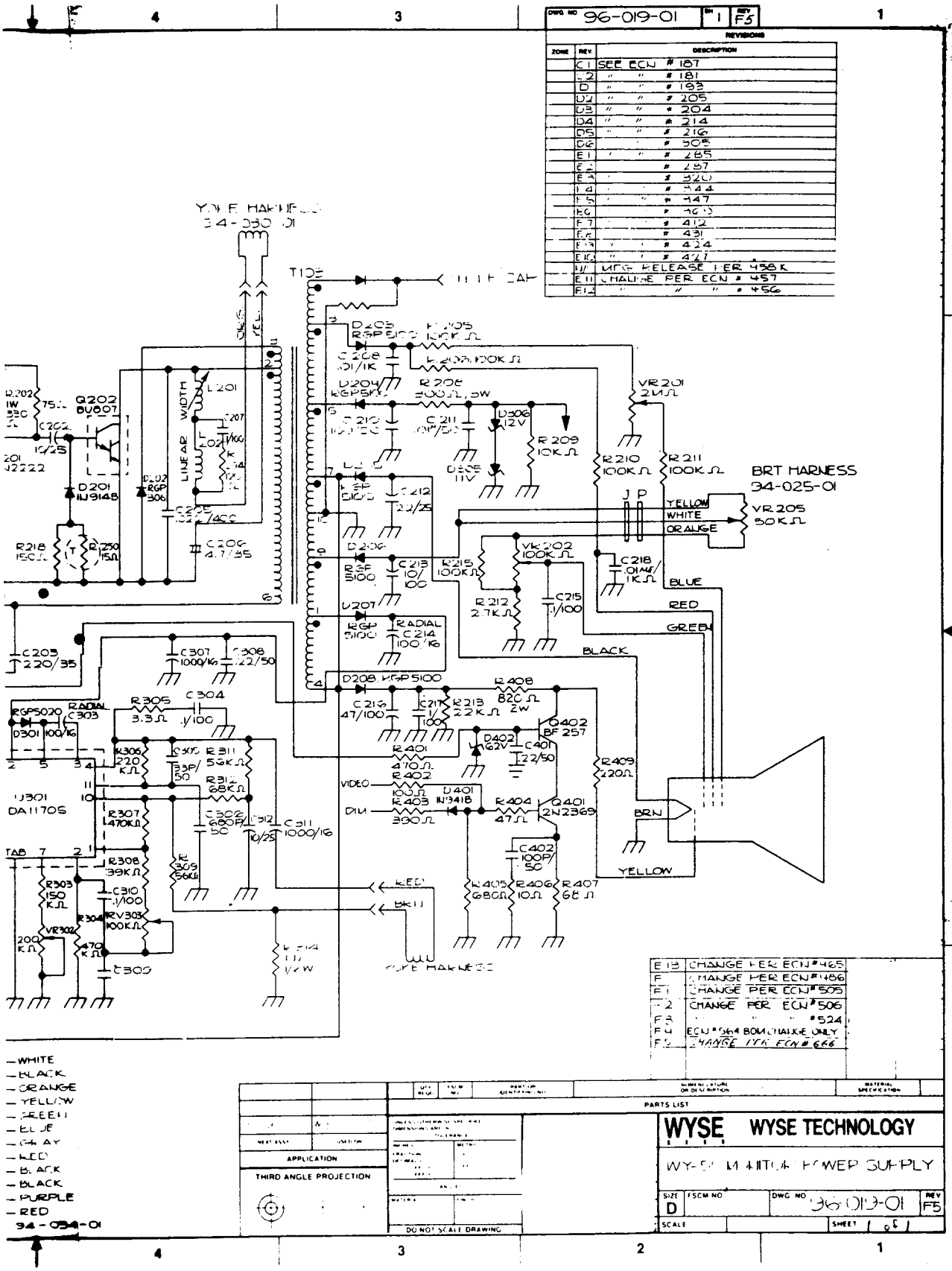

NOTES:
1. MOUNT LED NEAR PCB EDGE
2. LS157 — COMMON
3. ALL JUMPERS (JF) 0.1" SPACING.
TRACE ON SOLDER SIDE.
J1
MODEM PORT
25 PIN
DB SOCKET
J2
PRINTER PORT
25 PIN
DB SOCKET
J1-8 DCD
J1-5 CTS
J1-3 RXD
J1-4 RTS
J1-20 DTR
J1-2 TXD
J1-1 GND
J1-7 GND
J2-3 TXD2
J2-8 DCD2
J2-6 DSR2
J2-4 RTS2
J2-20 DTR2
J2-2 RXD2
J2-1 GND
J2-7 GND
Y1
4.9152MHZ
1-TAL
MC1489A
MC1488
2661-B
28 PIN
3K
LS04
LS14
+12V
+5V
-12V
-23V
GND
CERAMIC
CERAMIC
J3-11 KEY
CR8
IN753A
CR1
IN4148
CR5
IN4148
80/132
(SHT1)
BREQ (SHT1)
VTIR (SHT1)
REV/DIM PROT (SHT1)
GRAPHICS (SHT1)
EXFONT (SHT1)
SIO (SHT1)
SIOIR
AUX TXD
AUX RTS
AUX RDY
AUX RXD
BEEPER
NVD OUT (A2)
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A9
A8
C54, C55, C56, C57 ARE 47.4F @25V

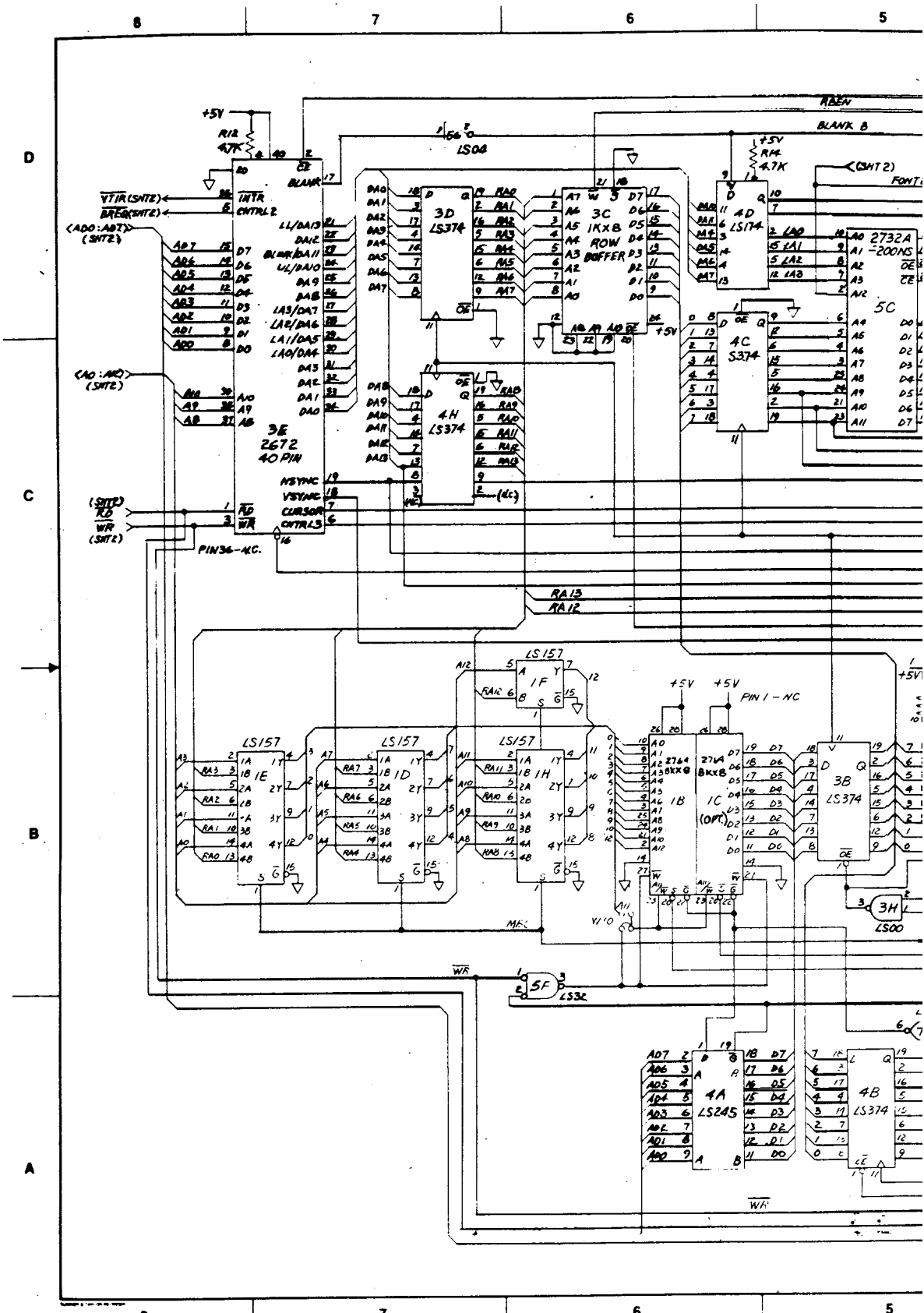

Y1
4.9152MHZ
C24
33pf
Y2
11.00 MHZ
C25
33pf
+12V
+5V
-12V
R18
12K
R19
12K
MC1489A
LS04
C9
470pf
R9
2.2K
R10
2.2K
C38
220pf
C37
220pf
C36
220pf
R1
4.7K
BREQ (SHT1)
VTIR (SHT1)
REV/DIM PROT (SHT1)
GRAPHICS (SHT1)
J3-11 KEY
LS14
CR8
IN753A
80/132 (SHT1)
LS04
3J
8031
INT0
TO
P1.6
T1
P1.4
P1.7
INT1
P1.2
TXD
P1.3
P1.0
RXD
P1.5
P1.1
RST
ALE
AD7
AD6
AD5
AD4
AD3
AD2
AD1
AD0
A15
A14
A13
A12
A11
A10
A9
A8
PSEN
WR
RD
+5V EA
GND
S10/R
EXFONT (SHT1)
AUX TXD
AUX RTS
AUX RDY
AUX RXD
BEEPER
NVD OUT (A2)
10uF
CRES
C16
R13
4.7K
JP7
1K
LS373
OE
TRACE
JP6
2764 - 300 ns
28 PIN
D7
D6
D5
D4
D3
D2
D1
D0
CS
KEYBR (SHT1)
3K
2661-B
28 PIN
RXRDY
DCD
CTS
RXD
RTS
DTR
TXD
R/W
RESET
S10 (SHT1)
R15
10K
R16
4.7K
C27
220pf
C28
220pf
C26
220pf
MC1488
W13
W11
W9
W14
C20
220pf
C19
220pf
C11
220pf
C12
220pf
R8
12K
J4-6
J4-12
J4-8
J4-9
J4-10
J4-7
J4-11
C57
C56
C55
C54
CERAMIC CAPACITOR
C49
0.1uF
GND
-12V
-23V
C54, C55, C56, C57 ARE 47uF @25V
CR1
IN4148
R2
8.2K
5B
LS174
ADO
AD1
AD2
AD3
AD4
AD5
CLR
EAROM (SHT1)
C29
0.1uF
IN751
5.1V
CR3
R22
10K
R17
100Ω
1/2W
R20
10K
R21
10K
R24
3.3K
Q3
2N2906
R23
6.8K
R25
10K
5X7406
6B
FONT 2/NORM (SHT1)
R6
4.7K
R40
1KΩ
IN4148
CR5
R41
1KΩ
C48
0.39uF
CBPR
RESET REF (SHT1)
2H
LM339
STAR GMB06
BEEPER
PLACE NEAR J4
LED
MV5754
CR6
CR7
IN4148
C58
47uF, 25V
CR2
IN4148
R7
680Ω
R8
4.7K
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SC

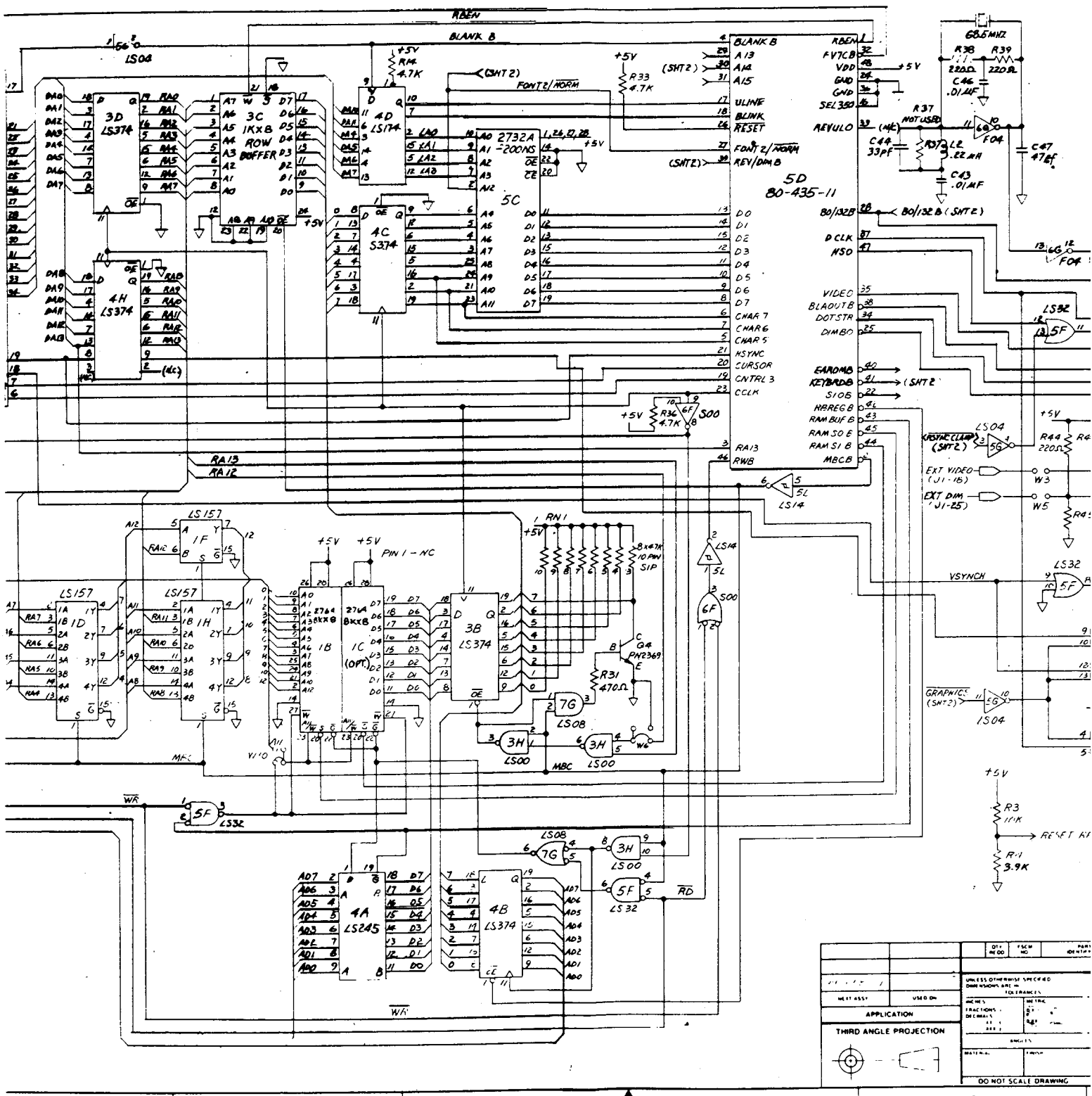

Y2
16.00 MHZ
C25
33pf
1K
LS373
+5V
TRACE
W7
JP6
2764 - 300 NS
28PIN
IN753AKG
CR15
CR9
CR10
CR11
CR12
CR13
1L
LS273
HSYNC CLAMP (SHT2)
J3-9
J3-8
J3-10
J3-7
J3-4
J3-5
J3-6
J3
KEYBOARD
J3-3
J3-2
J3-1
KEYBRD (SHT1)
C14
C16
C17
C18
IN753AX4
WR (SHT1)
RD (SHT1)
<AD0:AD7> (SHT1)
<A0:A15> (SHT1)
5B
LS174
5X7406
6B
EAROM (SHT1)
FONT2/NORM (SHT1)
R17
100Ω 1/2W
C29
0.1μF
IN751
5.1V
CR3
R22
10K
R20
10K
R21
10K
R24
3.3K
Q3
2N2906
R23
6.8K
R25
10K
7B
ER1400
14 PIN
VSS
CLK
C3
C2
C1
VGG
R26
12K
Q1
2N2906
R30
68Ω
CR4
IN747A
R29
18K
R27
33Ω
Q2
2N3904
R28
3.9K
-23V
R6
4.7K
LM339
R7
680Ω
R5
4.7K
CR2
IN4148
R8
4.7K
C7
0.1μF
NVDOUT (C-5)
J4
CR7
IN4148
C58
47μF, 25V
PARTS LIST
WYSE TECHNOLOGY INCORPORATED
LOGIC BOARD, WY-50
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
SIZE D
FSCM NO
DWG NO 96-058-01
REV C
SCALE
SHEET 2 OF 2

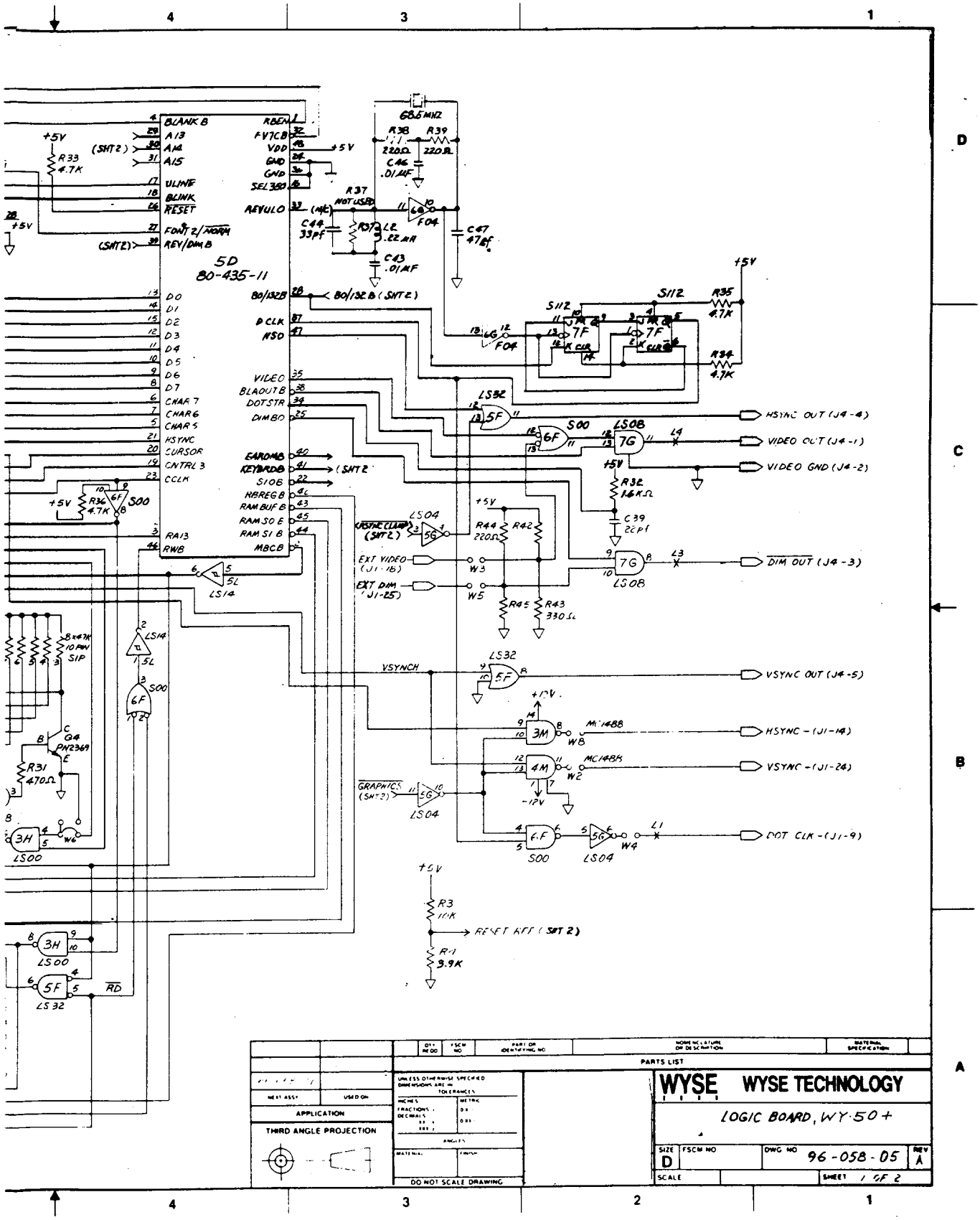

NOTES:
1_ALL RESISTORS ARE 1/4 W 5% UNLESS OTHERWISE SPECIFIED
2_ALL CAPACITORS ARE IN UF UNLESS OTHERWISE SPECIFIED
FUSE 2A, FOR 115VAC
2A, FOR 230V AC
ADJ +23.5V
VR101 +24.5
VR102 +5V
VR201 +12V
AC HARNESS
WHITE
BLACK
230V
115V
BR101 KBP310
T101
T102
L101
Q101 2N2222
Q102 2SC3150
D101 RGP5020
D102 SB540
D103 RGP5020
D107 RGP5020
U102 TL431
U103 4N35
R103 120KΩ 1/2W
R104 120KΩ 1/2W
R105 750KΩ 1/2W
R106 120Ω 1W
R107 33Ω
R109 680Ω 5W
R110 1.2Ω 3W
R111 1KΩ
R112 4.7KΩ
R114 680Ω
R116 20Ω
R117 47Ω
R118 680Ω 1W
R119 2.7KΩ
R120 100KΩ
R121 68Ω
R122 68Ω 3W
R301 10KΩ
VR101 1KΩ
VR102 1KΩ
C101 330/200
C102 330/200
C103 1/400
C104 .22/100
C105 10/25
C106 680P/1KV
C107 47/35
C108 1000P/500
C109 1000/50
C110 3.3/50
C111 .01M/50
C112 220/35
C113 .01/50
C114 100/25
C115 .22/50
C116 22/50
C117 100/25
C118
C119
C121 22/10
C122 22/50
C123 22/50
C124 .01/1K
C301 100P/50
C302 .1/100
D201 IN9148
HSYNC
VSYNC
+12V
+5V
-12V
VIDEO
DIM

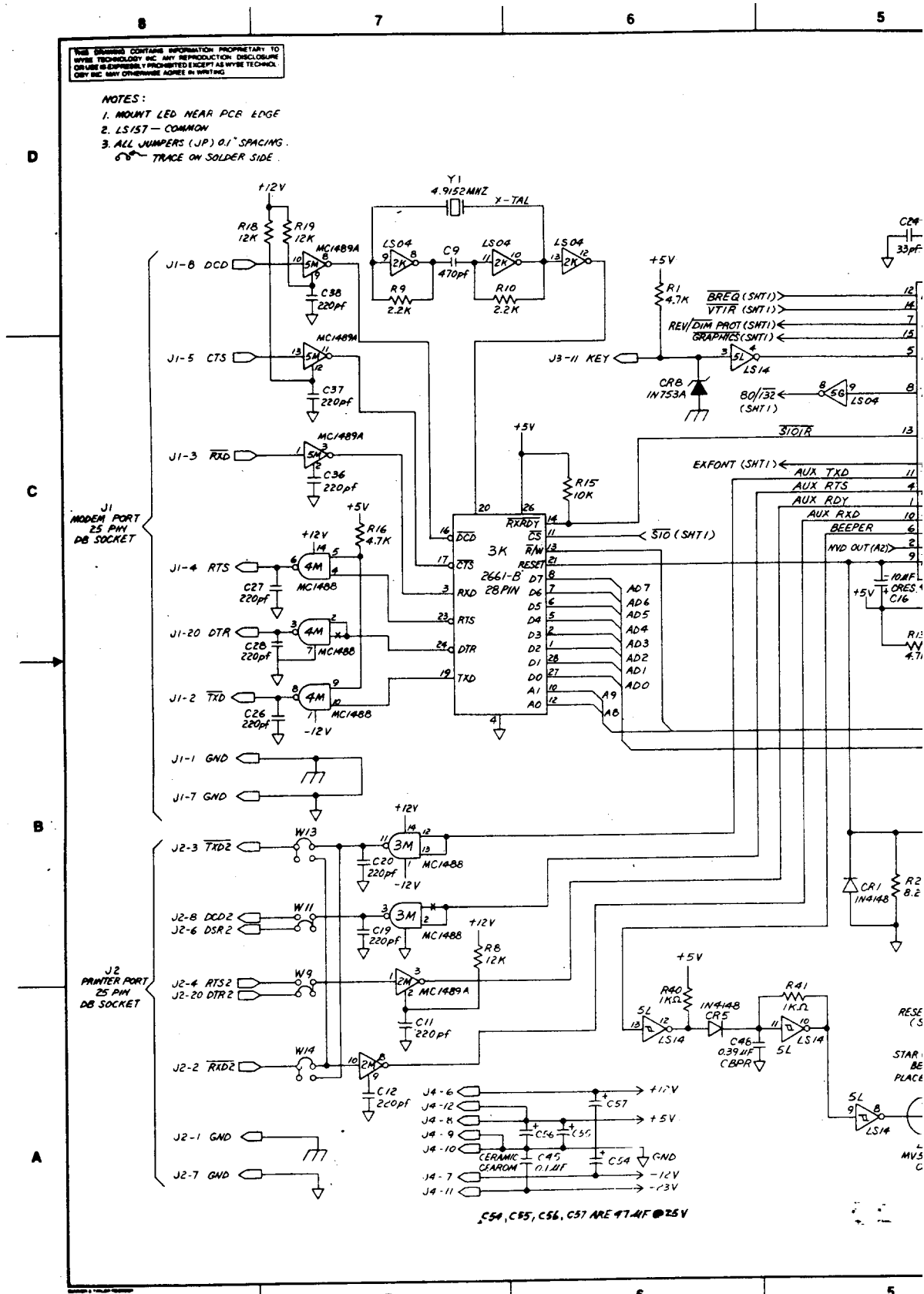

7
6
5
4
3
ARE 1/4 W 5% UNLESS OTHERWISE SPECIFIED
ARE IN UF UNLESS OTHERWISE SPECIFIED
ADJ
VR101 +24.5V
VR102 +5.0V
VR201 1.0V p-p
VR202 0.8V p-p
VR301 7.1MHz
VR302 7.1MHz
230V
115V
BR101 KBP306
T101
T102
T103
T104
T105
T106
T107
T108
T109
T110
T111
T112
T113
T114
T115
T116
T117
T118
T119
T120
T121
T122
T123
T124
T125
T126
T127
T128
T129
T130
T131
T132
T133
T134
T135
T136
T137
T138
T139
T140


DWG NO 96-019-01
SH 1
REV F5
REVISIONS
ZONE | REV | DESCRIPTION
C1 SEE ECN # 187
C2 " " # 181
D " " # 193
D1 " " # 205
D3 " " # 204
D4 " " # 214
D5 " " # 216
D6 " " # 505
E1 " " # 285
E2 " " # 257
E3 " " # 320
F4 " " # 344
F5 " " # 347
F6 " " # 363
F7 " " # 412
E6 " " # 431
E7 " " # 434
E8 " " # 447
D1 MFG RELEASE PER ECN # 458 K
E11 CHANGE PER ECN # 457
E12 " " " # 456
BRT HARNESS 34-025-01
YELLOW
WHITE
ORANGE
BLUE
RED
GREEN
BLACK
BRN
YELLOW
VR205 50K Ω
VR201 2M Ω
R210 100K Ω
R211 100K Ω
R209 10K Ω
VR202 100K Ω
R212 2.7K Ω
R215 100K Ω
C218 .01MF/ 1K Ω
C215 1/100
C213 10/ 100
C214 100/16
C212 2.2/25
C211 .01MF/50
C210 2.2/25
C209 .01/1K
C208 .01/1K
C207 1/100
C206 4.7/35
C205 220/35
C307 1000/16
C308 2.2/50
C304
R305 3.3Ω
C303 1/100
R306 220 KΩ
R311 56K Ω
R312 68K Ω
R307 470K Ω
R308 39K Ω
R309 56K Ω
C310 1/100
R303 150 KΩ
R304 RV303 100K Ω
VR302 200 KΩ
R302 470 KΩ
C309
C306 680P/ 50
C311 1000/16
C312
R313 4.7Ω 1/2W
R314 1Ω 1/2W
U301 DA1170S
TAB 7
R401 470Ω
R402 100Ω
R403 390Ω
R404 47Ω
R405 680Ω
R406 10Ω
R407 6Ω
R408 820 Ω 2W
R409 220Ω
C401 22/50
C402 100P/ 50
C216 47/100
C217 1/100
R213 22K Ω
D402 6.2V
D401 IN3418
Q402 BF 257
Q401 2N2369
VIDEO
DIM
D208 RGP5100
D209 RGP5100
D204 RGP5100
D207 RGP 5100
D306 12V
D305 6.8V
D201 IN9148
D202 RGP 306
Q202 BU007
L201
L202
T105
D301 RGP5020
C303 RADIAL 100/16
C214 RADIAL
R218 15Ω
R250 15Ω
R202 1W 330 Ω
C202 10/25
C201 .022
E13 CHANGE PER ECN # 465
F CHANGE PER ECN # 486
F1 CHANGE PER ECN # 505
F2 CHANGE PER ECN # 506
F3 " " # 524
F4 ECN # 564 BOM CHANGE ONLY
F5 CHANGE PER ECN # 666
WHITE
BLACK
ORANGE
YELLOW
GREEN
BLUE
GRAY
RED
BLACK
BLACK
PURPLE
RED
94-034-01
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
PARTS LIST
WYSE WYSE TECHNOLOGY
WY-5 MONITOR POWER SUPPLY
SIZE D
FSCM NO
DWG NO 96-019-01
REV F5
SCALE
SHEET 1 OF 1


8
7
6
5
D
C
B
A
+5V
R12
4.7K
LS08
3D LS374
3C 1K x 8 ROW BUFFER
4D LS174
4C S374
5C
2732A -200NS
3E 2672 40 PIN
4H LS374
INTR
CNTRL2
BLANK
VSYNC
CURSOR
CNTRL3
RD
WR
PIN36-NC.
LS157
1F
1E
1D
1H
1G
2764 8KX8
1C (OPT)
1B
3B LS374
3H LS00
5F LS32
4A LS245
4B LS374
BLANK B
FONT
MAC


RBEN
BLANK B
LS04
3D LS374
3C 1KX8 ROW BUFFER
4D LS374
4C S374
4H LS374
2732A -200NS
5C
5D 80-435-11
+5V
R33 4.7K
(SHT 2)
FONT 2/NORM
ULINE
BLINK
RESET
REV/DIM B
BLANK B
A13
A14
A15
RBEN
FV7CB
VDD
GND
GND
SEL350
REVULO
B0/132B
DCLK
NSO
VIDEO
BLADUTB
DOTSTR
DIMBO
EARDMB
KEYBRDB
SIOB
RBREGB
RAMBUFB
RAMSOB
RAMSIB
MBCB
68.6MHZ
R38 220Ω
R39 220Ω
C46 .01MF
R37 NOT USED
C48 33PF
R37 LL .22 MH
C43 .01MF
C47 47PF
F04
LS32
LS04
LS14
LS157
1F
1D
1H
2764 8KX8
1B
1C (OPT.)
3B LS374
RN1 8X47K 10 PIN SIP
R31 470Ω
PN2369
LS08
LS00
PIN 1 - NC
MRC
MBC
WR
RD
WA
4A LS245
4B LS374
R34 4.7K
R3 1.1K
R1 3.9K
RESET
EXT VIDEO (J1-16)
EXT DIM (J1-25)
VSYNCH
GRAPHICS (SHT 2)
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING


5D
80-435-11
68.5 MHZ
R38 220Ω
R39 220Ω
C46 .01μF
R37 NOT USED
C44 33pF
R37 LE .22μH
C43 .01μF
C47 47pF
FO4
S112
7F
R35 4.7K
R34 4.7K
+5V
LS32
5F
S00
6F
LS08
7G
HSYNC OUT (J4-4)
VIDEO OUT (J4-1)
VIDEO GND (J4-2)
R32 1.6K Ω
C39 22pf
DIM OUT (J4-3)
LS04
5G
R44 220Ω
R42
EXT VIDEO (J1-16)
EXT DIM (J1-25)
W3
W5
R45
R43 330Ω
LS14
5L
VSYNCH
VSYNC OUT (J4-5)
+12V.
3M
MC1488
HSYNC - (J1-14)
4M
VSYNC - (J1-24)
-12V
GRAPHICS (SHT3)
DOT CLK - (J1-9)
W4
R3 1.1K
RESET AFF (SHT 2)
R1 3.9K
3H
LS00
5F
LS 32
RD
BLANK B
A13
A14
A15
ULWF
BLINK
RESET
FONT 2/NORM
REV/DIM B
D0
D1
D2
D3
D4
D5
D6
D7
CHAR 7
CHAR 6
CHAR 5
HSYNC
CURSOR
CNTRL 3
CCLK
RA13
RWB
RBEN
FVTCB
VDD
GND
GND
SEL 350
REVCLO
80/132B
DCLK
MSO
VIDEO
BLAOUTB
DOTSTR
DIMBO
EARDMB
KEYBRDB
SIOB
RBREGB
RAM BUF B
RAM SO B
RAM SI B
MBCB
(SHT2)
Q4 PN2369
R31 470Ω
8x47K 10 PIN SIP
R36 4.7K
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
PARTS LIST
WYSE TECHNOLOGY
LOGIC BOARD, WY-50+
SIZE D
DWG NO 96-058-05
REV A
SCALE
SHEET 1 OF 2

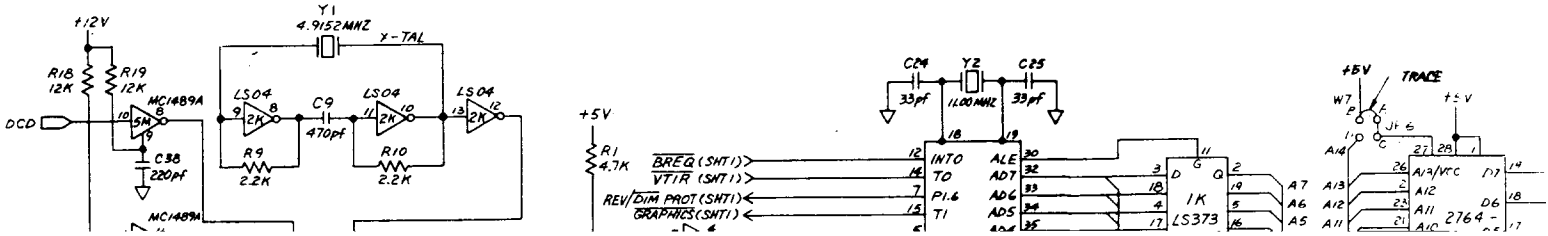

NOTES:
1. MOUNT LED NEAR PCB EDGE
2. LS157 — COMMON
3. ALL JUMPERS (JP) 0.1" SPACING.
TRACE ON SOLDER SIDE.
J1 MODEM PORT 25 PIN DB SOCKET
J2 PRINTER PORT 25 PIN DB SOCKET
Y1 4.9152MHZ X-TAL
3K 2661-B 28PIN
C54, C55, C56, C57 ARE 47μF @25V

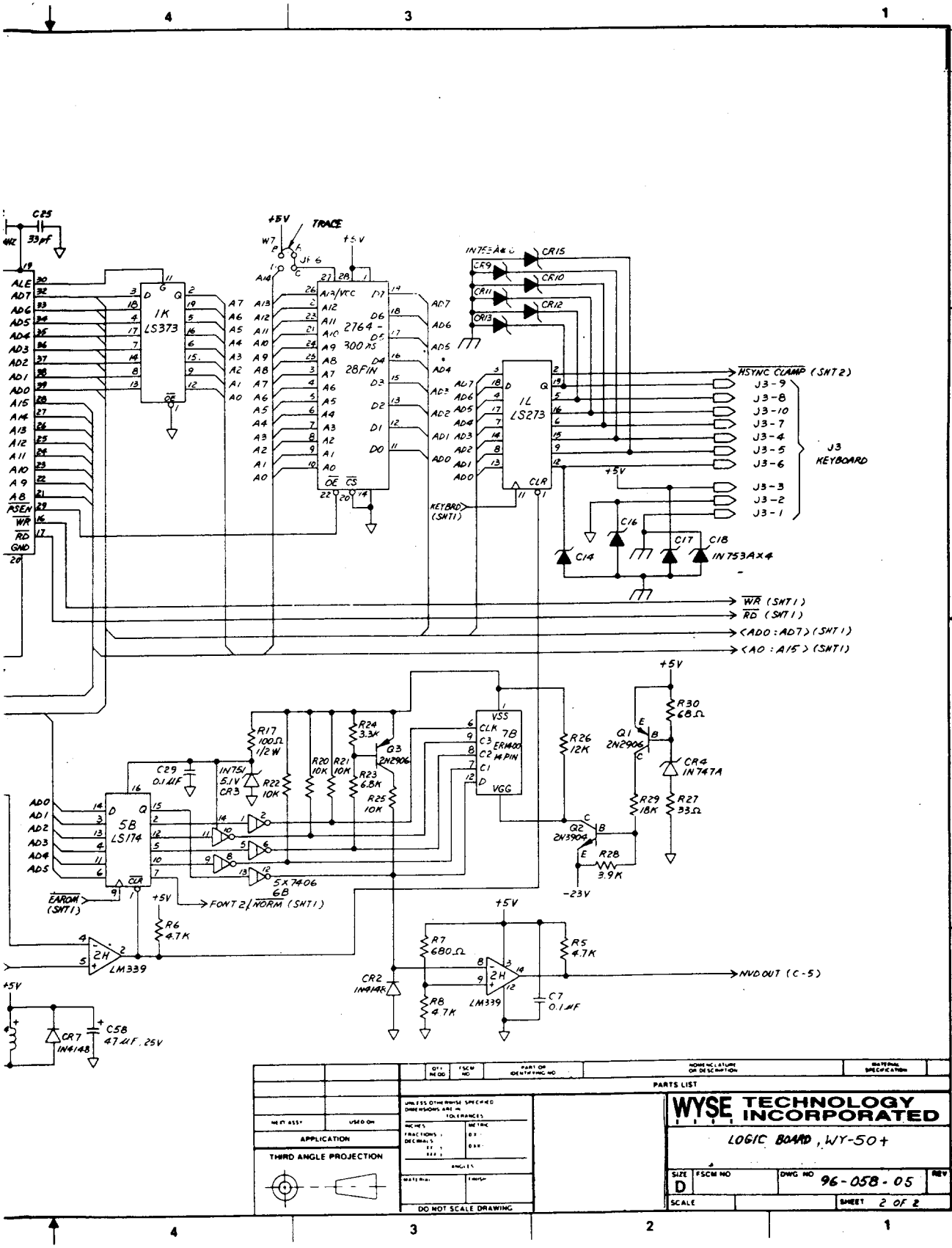
...N PROPRIETARY TO
...UCTION DISCLOSURE
...PT AS WYSE TECHNOL
...TING

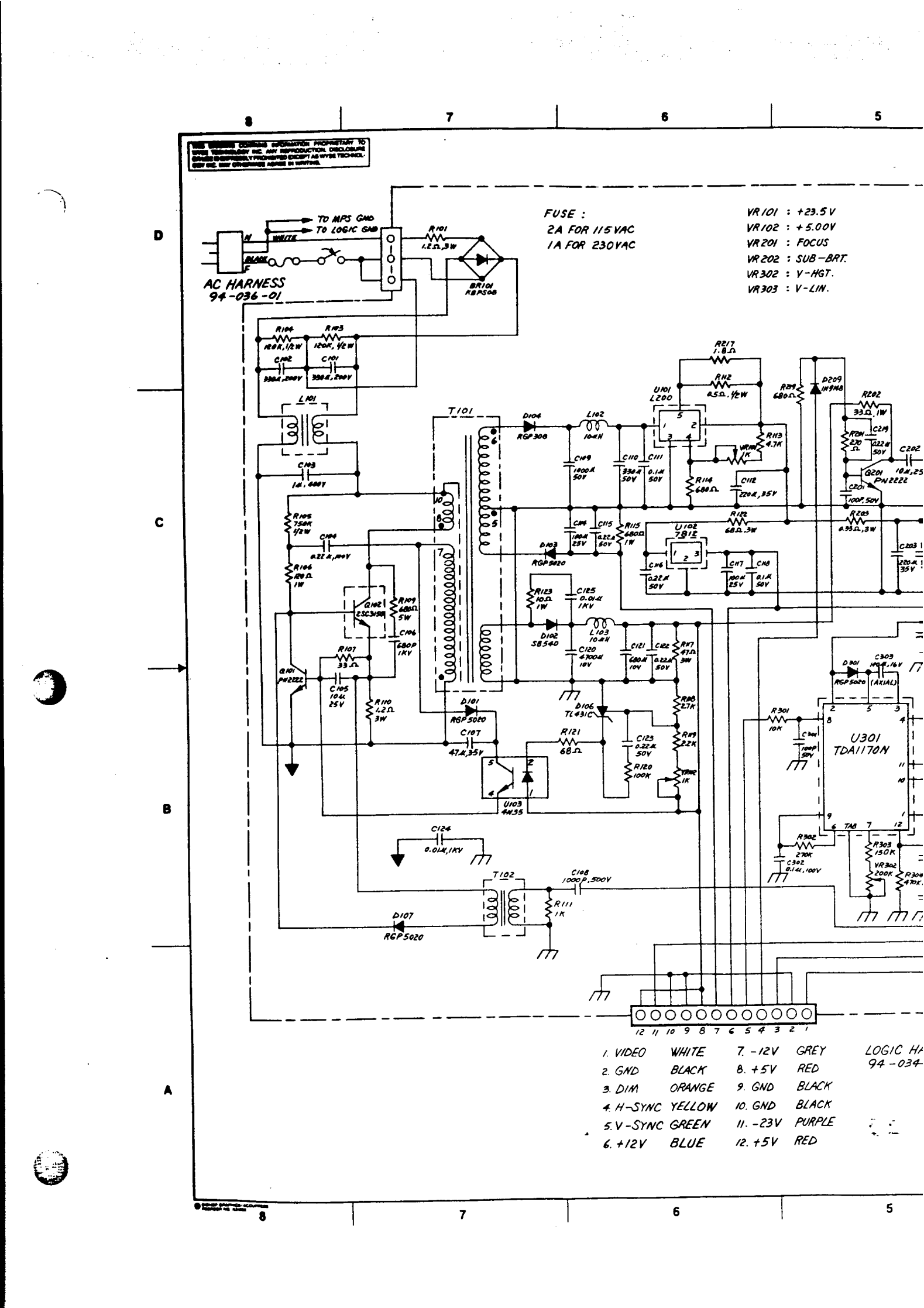
A PCB EDGE

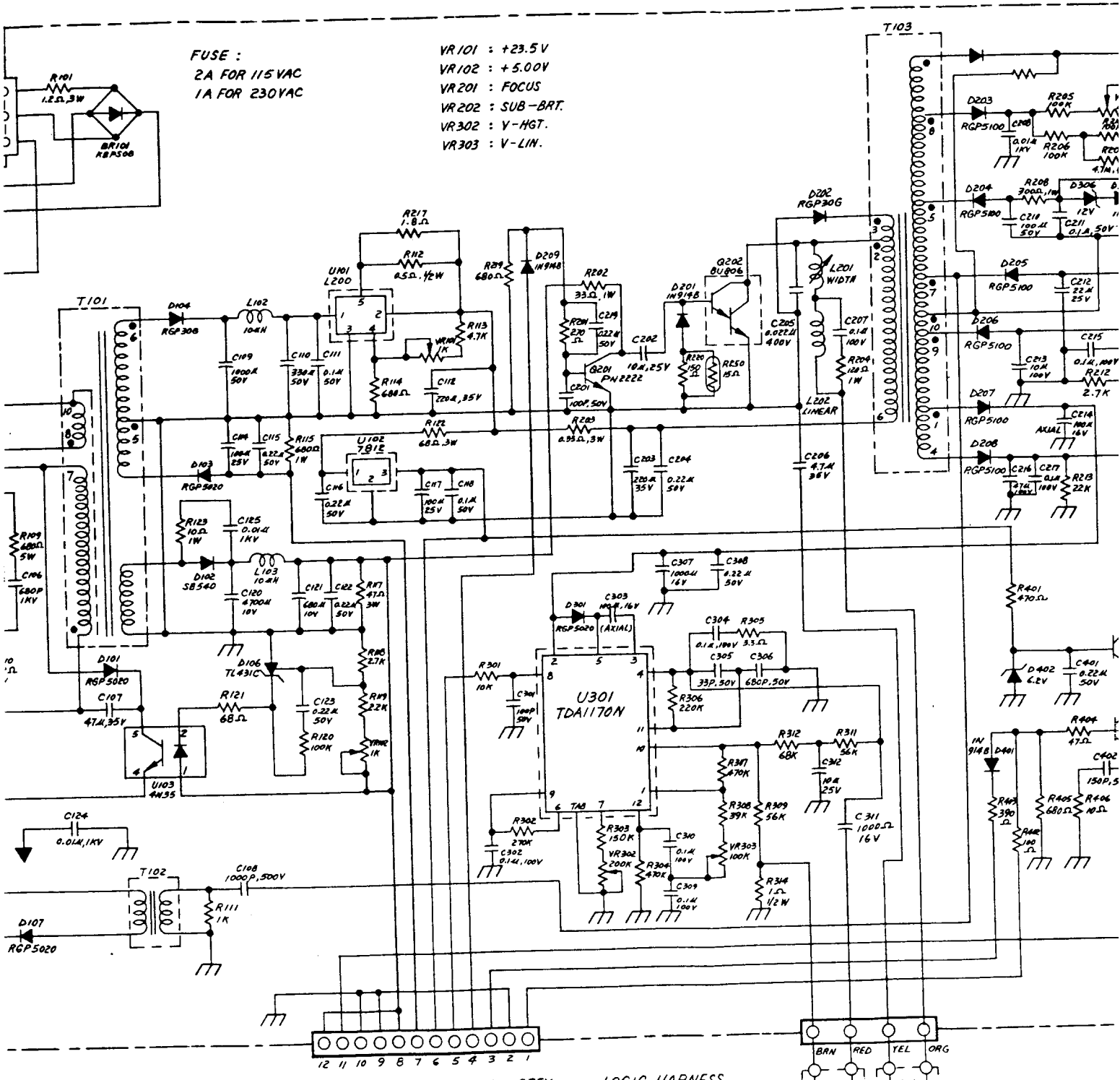
...) 0.1" SPACING.

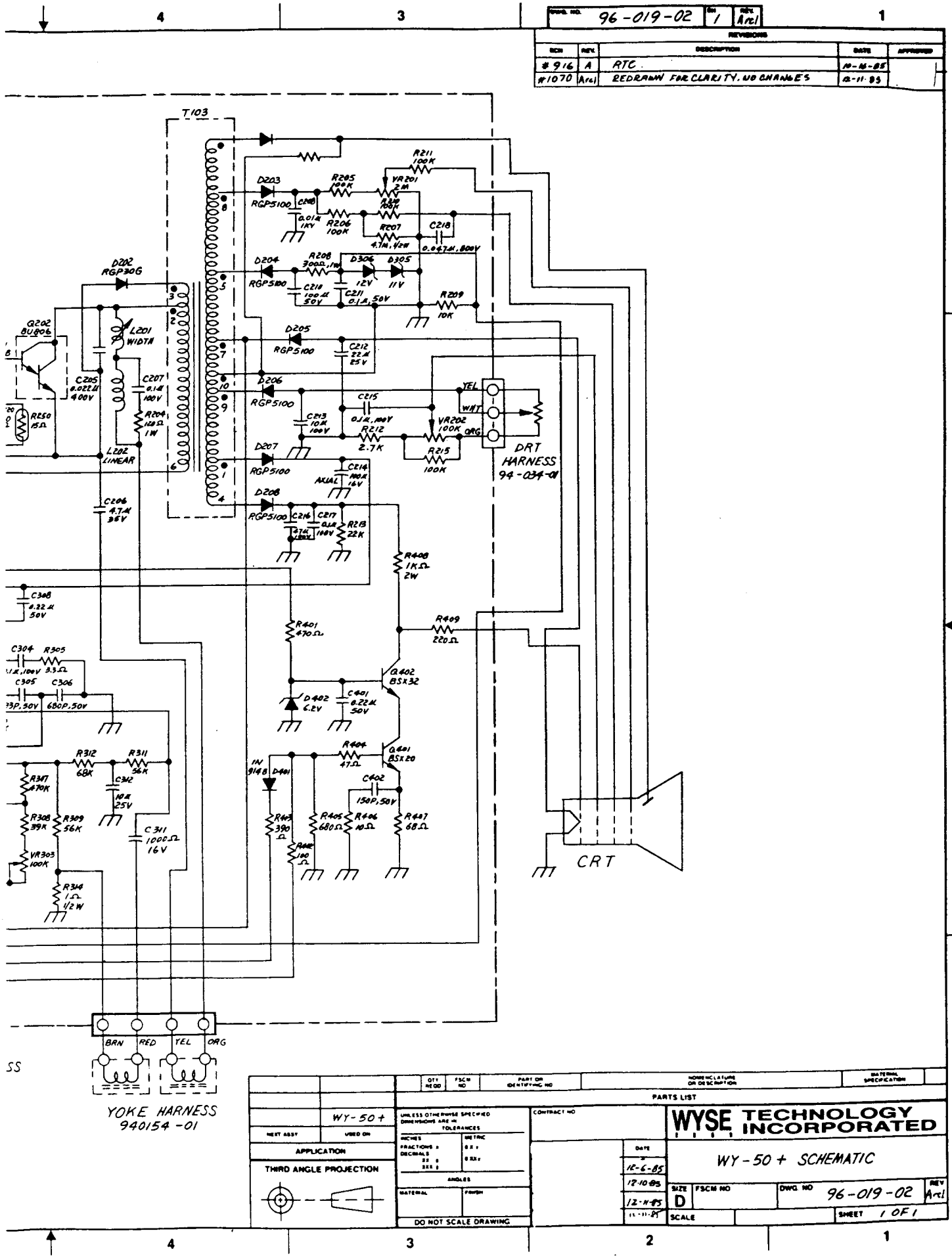
SOLDER SIDE.




4
3
1
D
C
B
A
C25
33pf
1K
LS373
2764 - 300 ns
28PIN
1L
LS273
TRACE
W7
J1-6
+5V
IN755A
CR15
CR9
CR10
CR11
CR12
CR13
HSYNC CLAMP (SHT2)
J3-9
J3-8
J3-10
J3-7
J3-4
J3-5
J3-6
J3
KEYBOARD
J3-3
J3-2
J3-1
C16
C17
C18
C14
IN753AX4
KEYBRD (SHT1)
WR (SHT1)
RD (SHT1)
<AD0:AD7> (SHT1)
<A0:A15> (SHT1)
R17
100Ω
1/2W
R24
3.3K
Q3
2N2906
R20
10K
R21
10K
R23
6.8K
R25
10K
R22
10K
IN755
5.1V
CR3
C29
0.1μF
R26
12K
VSS
CLK
C3
C2
C1
D
VGG
7B
ER1400
14 PIN
Q1
2N2906
R30
68Ω
CR4
IN747A
R29
18K
R27
33Ω
Q2
2N3904
R28
3.9K
-23V
5B
LS174
CLR
EAROM (SHT1)
FONT 2/NORM (SHT1)
5 X 7406
6B
R6
4.7K
2H
LM339
R7
680Ω
R5
4.7K
R8
4.7K
C7
0.1μF
CR2
IN914B
NVDOUT (C-5)
CR7
IN4148
C58
47μF, 25V
PARTS LIST
APPLICATION
THIRD ANGLE PROJECTION
DO NOT SCALE DRAWING
WYSE TECHNOLOGY INCORPORATED
LOGIC BOARD, WY-50+
SIZE D
FSCM NO
DWG NO 96-058-05
REV
SCALE
SHEET 2 OF 2


FUSE :
2A FOR 115VAC
1A FOR 230VAC
VR101 : +23.5V
VR102 : +5.00V
VR201 : FOCUS
VR202 : SUB-BRT.
VR302 : V-HGT.
VR303 : V-LIN.
AC HARNESS
94-036-01
TO MPS GND
TO LOGIC GND
WHITE
BLACK
R101
1.2Ω,3W
BR101
KBPS08
T101
T102
L101
L102
L103
U101
L200
U102
7812
U103
4N35
U301
TDA1170N
D101
RGP5020
D102
SB540
D103
RGP5020
D104
RGP30B
D106
TL431C
D107
RGP5020
D201
RGP5020
D209
1N914B
Q101
PN2222
Q102
2SC3198
Q201
PN2222
C124
0.01μ,1KV
C108
1000P,500V
C107
47μ,35V
R111
1K
1. VIDEO WHITE
2. GND BLACK
3. DIM ORANGE
4. H-SYNC YELLOW
5. V-SYNC GREEN
6. +12V BLUE
7. -12V GREY
8. +5V RED
9. GND BLACK
10. GND BLACK
11. -23V PURPLE
12. +5V RED
LOGIC HA
94-034


FUSE :
2A FOR 115VAC
1A FOR 230VAC
VR101 : +23.5V
VR102 : +5.00V
VR201 : FOCUS
VR202 : SUB-BRT.
VR302 : V-HGT.
VR303 : V-LIN.
T101
T102
T103
U301
TDA1170N
U101
L200
U102
7812
U103
4N35
Q201
PN2222
Q202
BU806
D202
RGP30G
L201
WIDTH
L202
LINEAR
D101
RGP5020
D102
SB540
D103
RGP5020
D104
RGP30B
D106
TL431C
D107
RGP5020
D201
IN914B
D203
RGP5100
D204
RGP5100
D205
RGP5100
D206
RGP5100
D207
RGP5100
D208
RGP5100
D301
RGP5020
D401
IN914B
D402
6.2V
R101
1.2Ω,3W
BR101
KBP306
R109
680Ω
5W
C106
680P
1KV
R111
1K
R112
0.5Ω,½W
R113
4.7K
R114
680Ω
R115
600Ω
1W
R117
47Ω
3W
R118
2.7K
R119
22K
R120
100K
VR102
1K
R121
68Ω
R122
68Ω,3W
R123
10Ω
1W
R124
0.33Ω,3W
R201
680Ω
R202
33Ω,1W
R203
270Ω
R204
120Ω
1W
R205
100K
R206
100K
R207
4.7M
R208
300Ω,1W
R209
680Ω
R210
150Ω
R211
15Ω
R212
2.7K
R213
22K
R214
47Ω
1W
R215
47Ω
1W
R216
47Ω
1W
R217
1.8Ω
R301
10K
R302
270K
R303
150K
R304
470K
R305
3.3Ω
R306
220K
R307
470K
R308
39K
R309
56K
R310
1Ω
1/2W
R311
56K
R312
68K
R313
1Ω
1/2W
R314
1Ω
1/2W
R401
470Ω
R402
47Ω
R403
390Ω
R404
47Ω
R405
680Ω
R406
10Ω
R407
100Ω
C101
0.01μ,1KV
C102
0.01μ,1KV
C103
0.01μ,1KV
C104
0.01μ,1KV
C105
0.01μ,1KV
C106
680P
1KV
C107
47μ,35V
C108
1000P,500V
C109
1000μ
50V
C110
330μ
50V
C111
0.1μ
50V
C112
220μ,35V
C113
100μ
25V
C114
0.22μ
50V
C115
0.22μ
50V
C116
0.22μ
50V
C117
100μ
25V
C118
0.1μ
50V
C120
4700μ
10V
C121
680μ
10V
C122
0.22μ
50V
C123
0.22μ
50V
C124
0.01μ,1KV
C201
100P,50V
C202
10μ,25V
C203
220μ
35V
C204
0.22μ
50V
C205
0.022μ
400V
C206
4.7μ
35V
C207
0.1μ
100V
C208
0.01μ
1KV
C209
0.22μ
50V
C210
100μ
50V
C211
0.1μ,50V
C212
22μ
25V
C213
10μ
100V
C214
100μ
16V
AXIAL
C215
0.1μ,100V
C216
47μ
100V
C217
0.1μ
100V
C218
47μ
100V
C301
100P
50V
C302
0.1μ,100V
C303
100μ,16V
(AXIAL)
C304
0.1μ,100V
C305
33P,50V
C306
680P,50V
C307
1000μ
16V
C308
0.22μ
50V
C309
0.1μ
100V
C310
0.1μ
100V
C311
1000Ω
16V
C312
10μ
25V
C401
0.22μ
50V
C402
150P,5
VR301
10K
VR302
200K
VR303
100K
TAB
LOGIC HARNESS
94-034-01
1. VIDEO WHITE
2. GND BLACK
3. DIM ORANGE
4. H-SYNC YELLOW
5. V-SYNC GREEN
6. +12V BLUE
7. -12V GREY
8. +5V RED
9. GND BLACK
10. GND BLACK
11. -23V PURPLE
12. +5V RED
YOKE HARNESS
940154-01
BRN
RED
YEL
ORG
WY-50
APPLICATION
THIRD ANGLE PROJECTION



DWG. NO.	SH	REV.
96-019-02	1	Arc1

REVISIONS

ECN	REV.	DESCRIPTION	DATE	APPROVED
#916	A	RTC.	10-16-85	
#1070	Arc1	REDRAWN FOR CLARITY. NO CHANGES	12-11-85	

QTY REQD	FSCM NO	PART OR IDENTIFYING NO	NOMENCLATURE OR DESCRIPTION	MATERIAL SPECIFICATION

PARTS LIST

NEXT ASSY | USED ON: WY-50+

APPLICATION: THIRD ANGLE PROJECTION

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN TOLERANCES
INCHES: FRACTIONS ± , DECIMALS .XX ± , .XXX ±
METRIC: X.X ± , X.XX ±
ANGLES
MATERIAL | FINISH
DO NOT SCALE DRAWING

CONTRACT NO

WYSE TECHNOLOGY INCORPORATED

WY-50+ SCHEMATIC

DATE
10-6-85
12-10-85
12-11-85

SIZE D | FSCM NO | DWG NO 96-019-02 | REV Arc1

SCALE | SHEET 1 OF 1